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ABSTRACT

A comparison is made of some of the notable features of the Japanese and U.S. labor markets. In Japan, as compared to the United States, for example, levels of employment tenure are higher, employer-employee attachment stronger, earnings-tenure profiles more steeply sloped, layoffs and dismissals much less frequent, and joint consultation and consensus-based decision making more common. To bring together these phenomena in a single conceptual framework, a theory is formulated that incorporates transaction-cost (communication cost) considerations into human capital theory. The theory draws a distinction between two types of investments: investments in firm-specific technical skills and investments in the reliability of information exchanged between employer and employees and among employees. This latter type of investment takes place in the Japanese practices. It is hypothesized that there are more investments in Japan than in the United States because, for various reasons, the investment costs are lower in Japan. The investments in both technical skills and in information reliability may be stimulated by technological progress, and the stimulation is greater the more elastic are the cost functions underlying these investments. It is argued that the cost function associated with the investment in information reliability is more elastic in a lower transaction-cost environment. A conclusion based on these results is that cultural-traditional influences, which shape the transaction-cost environment, probably interacted with technological progress in shaping many of the uniquely Japanese labor market phenomena. (177 references) (KC)

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The Japanese Labor Market in a Comparative Perspective with the United States

A Transaction-Cost Interpretation

Masanori Hashimoto
The Ohio State University

1990

W.E. UPJOHN INSTITUTE for Employment Research
Kalamazoo, Michigan

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The facts presented in this study and the observations and viewpoints expressed are the sole responsibility of the author. They do not necessarily represent positions of the W. E. Upjohn Institute for Employment Research.

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. . . To Barbara

The Author

Masanori Hashimoto has been professor of Economics and member of the Institute for Japanese Studies at The Ohio State University since 1987. He received his Ph.D. in Economics from Columbia University, and held apointments at Wayne State University, the University of Washington (Seattle), and Indiana University (Bloomington) before coming to Ohio State. He has also been a National Fellow at the Hoover Institution at Stanford University. He is currently associate editor of the *Journal of the Japanese and International Economies*, as well as on the editorial board for *Atlantic Economic Journal* and the *Journal of Economic Development*.

Professor Hashimoto's primary research interests have focused on the economics of fertility in Japan; effects of minimum wage laws on employment, labor-force participation, on-the-job training, unemployment, and youth crimes; human capital theory; and the Japanese labor market.

He has published numerous articles in the major professional journals. His other book, *Minimum Wages and On-The-Job Training*, was published by the American Enterprise Institute.

Preface

This book deals with some aspects of Japanese labor markets. It is not about Japanese management practices or about the "Japan-As-Number-One" syndrome. Nor does it aim to be a comprehensive treatment of Japanese labor market phenomena; instead, it presents an *economic* analysis of certain aspects of Japanese labor markets. As such, most empirical materials are examined from a particular analytical perspective. To formulate the analytical framework, I incorporate ideas from transaction-cost economics into the human capital theory. This approach, it will be argued, can potentially accommodate the analysis of how cultural and traditional factors interact with the influences of economic growth. This aspect of the theory is especially attractive for studying labor market institutions in Japan, because, in my view, such interactions likely helped shape many of the Japanese labor market practices during the country's economic development.

For institutional materials and data, I will rely heavily on existing studies, many of which are in English. Much of the quantitative evidence has been developed specifically for this project, though I draw on research findings reported in my previous works either alone or with John Raisian. Although the focus is on the Japanese scene, I will try as much as possible to place the analysis in a comparative perspective with the United States.

I wish to take this opportunity to acknowledge my indebtedness to some of the many individuals who have influenced the intellectual orientation of this book: my teachers, Gary S. Becker and Jacob Mincer, who encouraged me to analyze Japanese labor markets; Yoram Barzel, Steven N.S. Cheung, Levis Kochin, and Keith B. Leffler, who taught me what transaction-cost economics is about; Ben T. Yu, who collaborated with me on a paper which set the direction for this research; Masatoshi Kuratani, who, through his Ph.D. dissertation in the early 1970s and through subsequent contacts, sparked my interest in applying human capital theory to Japan; and John Raisian, my co-author on many of the papers on Japan–U.S. labor market comparisons, for many years of productive work together and for letting me use in this book some of the material we developed together.

Some of the related materials were presented to the conferences held in Santa Clara (1986), West Berlin (1986), Yokohama (1986), Brussels (1988), Washington, D.C. (1989), Madison (1989), and New York (1990). I would like to take this opportunity to thank the organizers and commentators of these conferences: Ernst W. Stromsdorfer, Peter T. Chinloy, and Duane E. Leigh (Santa Clara); Robert A Hart, John P. Martin, and Peter McGregor (West Berlin and Brussels); Kazutoshi Koshiro, Fumio Ohtake, Akira Ono, and Yoko

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At about the time this manuscript was being edited, I began investigating the training and employment practices at the Japanese automobile transplants in the U.S. Midwest. By mid-August, 1990 I had visited and interviewed the key personnel at two companies—Subaru-Isuzu Automotive Inc. (SIA) and Diamond-Star Motors (DSM)—and made a preliminary visit to Honda of America Manufacturing (HAM), as well. I ha incorporated some of what I learned from these visits into the relevant discussions, especially in chapter 5. I wish to thank these companies for agreeing to participate in my study.

Many people read portions of this manuscript and related papers and offered useful comments and discussions. I wish to thank Yoram Barzel, Gary S. Becker, Barbara L. Brugman, Linda N. Edwards, Yoshio Higuchi, H. Allan Hunt, Susan N. Houseman, Todd L. Idson, Fuchun Jin, Jacob Mincer, Hajime Miyazaki, Alice Nakamura, Donald O. Parsons, Robert G. Spiegelman, and Ben T. Yu. I am grateful to two anonymous reviewers for reading the entire manuscript and offering many constructive comments. I relied on Reiko Aoki and Tatsuro Ichiishi for mathematical advice and Paul Evans for advice on time-series analysis, all of whom graciously offered their help on the spot. I wish to acknowledge the competent research assistance by Apurva Mathur and Fuchun Jin. Since I refer to some of the evidence developed in my previous works, it is appropriate to acknowledge the funding received from the U.S. Department of Labor (Office of Assistant Secretary) and the Hoover Institution (National Fellowship) to help finance them. The Ohio State University also provided partial summer research support in 1987, 1988, and 1990. I also wish to acknowledge my gratitude to Katharine G. Abraham, Yoshio Higuchi, Takatoshi Ito, Kazutoshi Koshiro, Machiko Osawa, and Haruo Shimada for facilitating my collection of materials. Judith K. Gentry's conscientious editorial supervision is gratefully acknowledged. My sons, Barry Masanori and Jeffrey Masayuki, helped uplift my spirits, and my wife, Barbara Brugman, not only offered emotional support and encouragement throughout this project, but also served as precious advisor. Finally, to those who helped me along the way but whose names I may have neglected to mention, I offer my sincere apologies along with gratitude.

SUMMARY

This book develops a unified understanding of some of the notable Japanese labor market features in a comparative perspective with the United States. In Japan, as compared to the United States, for example, levels of employment tenure are high, employer-employee attachment strong, and earnings-tenure profiles steeply sloped. Layoffs and dismissals are used much less frequently in Japan than in the United States, with adjustments in hours of work and inventories assuming a greater importance. Industrial relations in Japan contain some unique institutions, such as joint consultation and consensus-based decisionmaking, and work organization exhibits a great deal of flexibility. Not to be overlooked is the phenomenon of Japanese employers and employees spending a great deal of informal time together after work hours. This expenditure of time is viewed here as an investment in the employment relationship, and reflects the overall greater investment in the employment relationship in Japan than in the United States. This investment difference results in a stronger employer-employee attachment in Japan than in the U.S., as evidenced by the considerably smaller number of days lost in labor disputes in Japan.

To bring together these phenomena in a single conceptual framework, a theory is formulated which incorporates transaction-cost considerations into human capital theory. Transaction costs in this analysis denote costs of communicating information between the employer and the employee as well as among the employees, including the costs of convincing the other party of the information's veracity. The theory draws the distinction between two types of investments: investments in firm-specific technical skills and investments in the reliability of information exchanged between the employer and employees and among employees. It is this latter type of investment that takes place in the Japanese joint consultation system, quality control circles, and consensus-based decisionmaking, as well as in the time spent with co-workers in restaurants and bars.

This book hypothesizes that there are more investments in Japan than in America because, for various reasons, the investment costs are lower in Japan. An autonomous increase in the investment in information reliability is found to encourage the investment in technical skills. Similarly, an autonomous increase in the investment in technical skills stimulates the investment in information reliability. Most important, the investments in both technical skills and in information reliability may be stimulated by technological progress, and the stimulation is greater the more elastic are the cost functions underlying these investments. It is argued that the cost function associated with the investment in information reliability is more elastic in a lower transaction-cost environment.

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Based on the above results, the book argues that cultural-traditional influences, which shape the transaction-cost environment, likely interacted with technological progress in shaping many of the uniquely Japanese labor market phenomena. In particular, the productivity enhancement campaign (*seisansei undo*) that began with the establishment of the Japan Productivity Center in 1955 encouraged rapid technological progress, which in turn stimulated the investment in firm-specific technical skills. The increased investment in technical skills encouraged the investment in information reliability, and this whole process was boosted by the low-transaction cost environment that prevailed in Japan. The increased information reliability further stimulated the investment in technical skills. As a result, the employer-employee attachment became strengthened, and it became manifest in such labor market institutions as joint consultations, consensus-based decisionmaking, and enterprise unions, all of which became widespread in Japan after the late 1950s.

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Introduction

Japan and the United States today represent the two most successful free market economies in the world. These two economies share many similarities: both operate in highly competitive and open markets; both have enjoyed strong positions in manufacturing and high technology industries; and both have experienced significant sectoral shifts in employment since the early 1970s. These and other similarities, however, should not make one overlook important differences between the two economies. It is these contrasts that offer fertile bases for new insights. Whether the differences are due to cultural, traditional, or economic factors, it seems undeniable that they ultimately manifest themselves in the conduct of employers and employees, and in the labor market institutions.

Many of the differences have already been noted in the literature. They include the following:

1. In Japan, long-term employment is more prevalent, employer-employee attachment is stronger, and employee tenure in a firm has a more substantial effect on worker earnings when compared to the United States (Hashimoto and Raisian 1985, 1989; Mincer and Higuchi 1988). The labor-management relationship is evidently more cooperative in Japan than in the United States—turnover rates are considerably lower, and the number of days lost in labor disputes much smaller.[1]

2. The Japanese and U.S. economies differ in the ways that employment, hours of work, and inventories adjust over the business cycle. Layoffs and dismissals are extremely rare in Japan. Instead, adjustments in hours of work, wages, and inventories assume a relatively greater role over the business cycle in that country than in the United States (Gordon 1982; Hashimoto and Raisian 1987, 1988; Abraham and Houseman 1989).[2]

3. The two economies have typically coped differently with declining manufacturing industries. Since the 1970s, workforce reductions in Japan were achieved with less reliance on outright dismissals than in the United States.

4. In the Japanese wage system, workers typically receive a significant portion of earnings in bonuses, whereas bonuses received by U.S. workers are rarely significant (Hashimoto 1979; Freeman and Weitzman 1987). In addition, wage bargaining in Japan is synchronized to the annual spring offensive (*shunto*) – an arrangement that helps make wages more flexible there than in the United States (Gordon 1982; Taylor 1989).

5. Japanese labor contracts are brief, leaving much room for continuous adjustment by mutual consent of the parties involved (Hanami 1981). Labor and management engage frequently in joint consultations, and major decisions are arrived at after an extensive sharing of information and the consensus-building procedure called *nemawashi*.[3]

6. Unions in Japan are enterprise-based. Although most unions belong to national-level federations, the basic issues of wages, working conditions, and like factors are negotiated at a firm level. Unlike the local of an American industrial union, the Japanese enterprise union, which typically includes white-collar nonsupervisory employees as well as blue-collar workers, is not merely an administrative unit of a national union.[4]

The book argues that many of the differences in labor market practices between the two countries – or for that matter among any countries – reflect contrasts in the investment made in the employment relationship. What factors determine the investment differences? To answer this question, one might expect the theories of employment contracts, which have been the focus of many recent theoretical studies, to offer some guidance.[5] As they now stand, unfortunately, employment contract theories in the literature are not particularly suited for cross-country studies, as most were motivated by labor market phenomena in the United States.

For example, the main prediction from the implicit contract theories, first introduced by Azariadis (1975), Baily (1974), and Gordon (1974), and subsequently elaborated on by a number of researchers, is that in the

long-term employment relationship wages will be rigid, with workers facing a positive probability of layoff during economic downturns. This prediction seems to conform to the tendencies toward wage rigidity and the frequent use of layoffs that characterize the U.S. labor market.[6] It is not consistent, however, with the experience of Japan, known for its long-term employment relationships. There, workers in the *shushin koyo* (permanent employment) system rarely experience U.S.-type layoffs, and their wages are quite flexible, as they contain semi-annual bonuses and are renegotiated every year. The implicit contract theories may have the potential to accommodate Japanese phenomena, but such an extension is not obvious.

Clearly, a theory is needed that can help achieve a unified understanding of such labor market phenomena as labor turnover, earnings, and the strength of the employer-employee attachment. An important aim of such a theory should be to explain contrasts among labor market practices in different countries. Implicit contract theories, however, not having been designed to address the turnover issue, would have difficulty in achieving this aim. For example, one may assert, as the implicit contract theories do, that a typical firm has the incentive to offer a long-term employment contract, but what is there to prevent workers from leaving for another job during the life of the contract?

In fact, many U.S. workers do change jobs frequently, though job separations decline with years of tenure. Typical Japanese workers appear more reluctant than their U.S. counterparts to separate for the purpose of taking another job.[7] Clearly, it is desirable for a theory of employment contract to treat the separation incentives of the employer and the employee as they relate to earnings and other characteristics of the employment relationship. In this vein, the potential usefulness of the theory of firm-specific human capital seems obvious, as it can account for how turnover and earnings change with tenure in the firm.[8] As Rosen (1985) stated, "some consideration for differences in firm-specific human capital, labor mobility, and quasi-fixed factor ideas are required to fully account for international differences in labor market phenomena" (p. 1165).

It will be argued that cultural/traditional influences likely interacted

with technological progress in shaping many of the uniquely Japanese labor market phenomena. To analyze this interaction, chapter 2 discusses a theory that combines transaction-cost considerations with human capital theory. Transaction costs in this theory refer to the costs of communicating and verifying relevant information between employer and employees, and they are viewed as playing a central role in shaping many of the labor market institutions. Since culture and tradition can be interpreted as influencing transaction costs, the proposed theory offers a way of bringing these noneconomic factors into economic analysis.

In previous works, I have argued that positive transaction costs are the key factor in the sharing theorem of the human capital theory, and proposed that wage flexibility enhances the value of contracts involving firm-specific human capital (Hashimoto 1979, 1981; Hashimoto and Yu 1980). Here, I extend those analyses and offer a conceptual framework for a comparative study of Japanese and American labor markets. I postulate that the employer and employee invest in the employment relationship in order to enhance their mutual well-being. I distinguish between two types of investments: investment in the employee's technical skills and investment in the reliability of all types of information exchanged within the firm. The effect of investing in the employee's technical skills on productivity is obvious. The investment in the reliability of information reduces mistrust, disputes, and inefficient decisions, and thereby promotes cooperative industrial relations and productivity. In my framework, the usual term *training*, or *firm-specific human capital*, refers to the package of these investments. The greater these investments the more productive the employment relationship.

An increased investment in technical skills stimulates the investment in information reliability and vice versa. The independent variables are the costs associated with these investments and the worker propensity for mobility. The cost of investing in technical skills is a function of how well the formal education system prepares students for training by imparting positive attitudes for learning as well as by teaching basic skills. The cost of investing in information reliability reflects the transaction-cost environment, which in turn is affected by the degree of cultural heterogeneity of the workforce, the attitudes of the management

and workers, and the workers' abilities to function cooperatively as a group. Finally, a high worker propensity for mobility reduces the returns to these investments and so discourages training.

I hypothesize that there are more investments in Japan than in the United States because, for various reasons, the investment costs and the mobility propensity are lower in Japan. One of the theorems that emerges is that economic growth and technological progress can stimulate both types of investment and that each type, in turn, reinforces the other. Japanese investments in employment relations became pronounced in the 1960s, coinciding with that economy's rapid technological change and accelerated economic growth.

It might be said also that to fully understand labor market differences between countries, one would have to pay attention to differences in the laws regulating the labor markets and in the institutions of industrial relations. But laws and institutions are themselves endogenous, and a complete investigation must go even further by analyzing the manner in which they are shaped by exogenous factors such as culture and tradition. It is hoped that this study makes a contribution to future investigations by suggesting how influences of culture and tradition may be incorporated into an economic analysis.

Economists tend to shun invoking the influences of culture and tradition in explaining real-world phenomena, but it would seem inappropriate to deny the influence of these factors altogether, especially in cross-country comparisons. At the same time, an explanation based on culture and tradition alone would seem unsatisfactory, especially if it suggests unchanging persistence over time in labor market features. A more productive approach would be to investigate how traditional and cultural factors shape labor market characteristics in response to changing circumstances.

In studying Japanese-U.S. differences in labor markets, one hesitates in appealing solely to culture and tradition, because some of the labor market differences appear to have emerged rather recently. For example, (1) Japanese labor turnover appears to have been quite high from the early 1900s through the early 1950s (Taira 1970; Shimada 1983; Gordon 1985); (2) the often-noted wage rigidity in the United States appears

to have emerged after the end of World War II, when a drastic decline in the responsiveness of wages to economic conditions took place (Gordon 1982); and (3) the Japanese style of industrial relations became prevalent after the late 1950s when the rate of economic growth began to accelerate as a result, in my opinion, of the productivity enhancement campaign (*seisansei undo*) launched in 1955.

Although labor market flexibility has been a topic of considerable recent interest, there have been only a few analyses of the underlying causes of differential flexibility across countries.[9] It is hoped that the theory presented in this book will contribute to closing this gap. Also, the existing literature on transaction costs lacks an explicit model of how transaction costs affect behavior, though many of the discussions are thoughtful and provocative (e.g., Klein, Crawford, and Alchian 1978; Williamson 1975, 1985). An important contribution of this book is to incorporate transaction costs explicitly into the theory of firm-specific human capital.[10]

Employment Categories in Japan

Let me end this chapter by discussing the definitions of employment categories in Japan. The Japanese labor force includes persons 15 years of age or older, in contrast to the U.S. labor force for which the youngest age is 16 years. Employed persons in Japan are classified into those at work and those not at work (*kyugyosha*). This latter category consists of persons who are not currently working but are kept on payroll and counted as employed persons.[11] Some of the workers in this category may, in fact, be on temporary layoff (Hashimoto 1990c). If so, they would be classified as being unemployed rather than employed were they in the United States.

Whether at work or not, employed persons are categorized by employers as self-employed workers, family workers, and/or employees (see dotted line in table 1.1). The employee category, in turn, consists of regular workers, temporary employees, or day workers. Self-employment has the same meaning as the U.S. definition, and family

workers – those who work in an unincorporated enterprise operated by a member of the family – may be paid or unpaid.

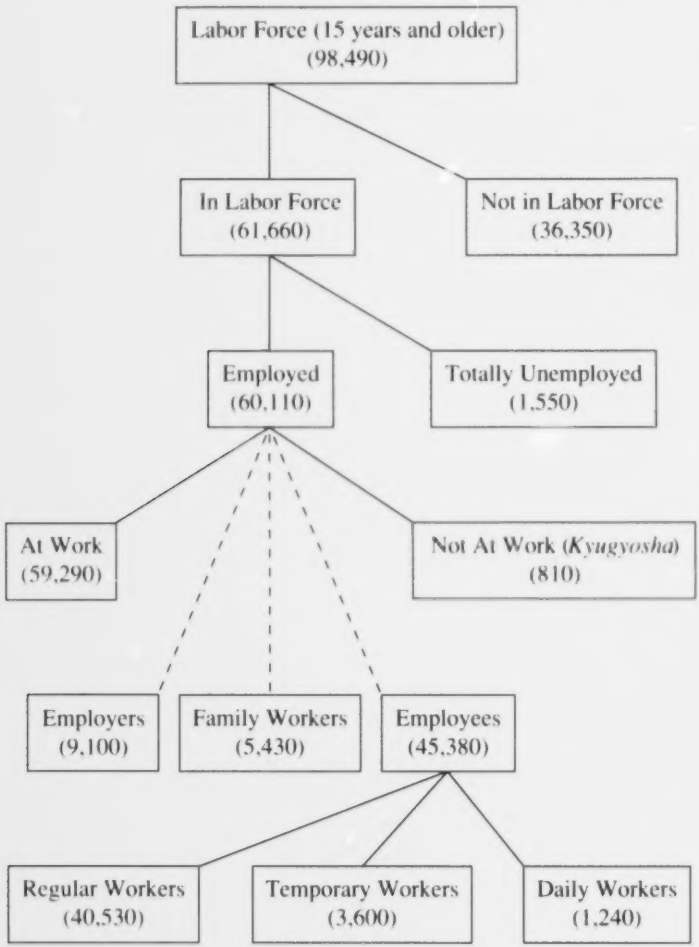
In 1988, self-employed and family workers amounted to about 18.8 percent of all nonagricultural employment, a much larger proportion than the U.S. figure of about 8 percent.[12] Japanese women are more likely to be family workers than are men. In 1988, 13 percent of employed females in the nonagricultural sector belonged to the family-worker category, as compared to 1.9 percent for males. The proportion for self-employment in the nonagricultural sector was 11.2 percent for females and 13.5 percent for males.

Much of what one reads about the uniqueness of the Japanese labor market refers to regular workers. Regular workers are under employment contracts with an unspecified length of employment duration, and many of them, especially in large firms, are in the *shushin koyo* (lifetime employment) system with *nenko* (tenure-based) wage schedules.[13] Their earnings consist of regular wages and the famous twice-yearly bonuses, which sometimes amount to about 30 percent of their total receipts.[14] Among male nonagricultural employees, 94.6 percent were regular workers in 1988, as compared to 80.6 percent of the females. Male regular workers have been a significant human resource in Japan, at least in the marketplace, with the employment practices for this category of worker serving as models for other workers in Japan.

Temporary workers have contracts with a period of employment lasting more than a month but less than one year, and day laborers with an employment period lasting less than a month. These contracts are renewable. Casual observations suggest that temporary workers in Japan tend to work for the same employers.[15] Many of these workers in effect may have more than transitory attachments to their employers. It is difficult to make a similar distinction in the U.S. data. A student hired for a summer job, for example, is indistinguishable from a young household head with a permanent job.[16]

Employed Japanese women are more likely than men to be family workers, temporary workers, or day laborers. Also, almost 29 percent of female employees in the nonagricultural sector, as compared to 6.2 percent of males, worked fewer than 35 hours per week in 1988. Thus,

Table 1.1 Employment Categories in Japan (1,000 persons in 1988)



SOURCE: Japan Productivity Center, *Katsuyo Rodo Tokei* (Practical Labor Statistics) 1990, p. 238.

Japanese women do appear to have a weaker attachment to the labor market than men.[17] It should be noted, however, that the proportion of females who are family workers has been declining in Japan. In 1965, the proportion stood at 36.8 percent, but by 1975 it had declined to 25.7 percent. In 1986, it was 19.4 percent. This decline is one of the key factors behind the decline in female labor force participation in Japan that took place in spite of rising female wages during the postwar years (Hill 1983; Shimada and Higuchi 1985; Osawa 1988). According to these authors, participation of females in paid sectors experienced an upward trend, as expected, throughout most of the postwar years. It is the declining importance of family workers that contributed to the lowering of the overall participation rate for Japanese women.

NOTES

[1] The two countries have been diverging from each other in the number of days lost due to labor disputes. The days lost in Japan started to follow a downward trend around 1960, but in the United States the trend has been moderately upwards during most of the postwar years. See chapter 3.

[2] The weaker reliance on outright dismissals for workforce reductions undoubtedly is a factor in the lower unemployment rates in Japan as compared to those in the United States (Ito 1984).

[3] *Nemawashi* literally means digging around the roots of a tree and trimming them in advance to ensure a successful transplant or to promote the bearing of abundant fruits. Its figurative meaning is to take every necessary step by communicating with individuals who are involved to bring about a desired outcome. Joint consultation is the primary channel through which management and labor deal with such issues as recruitment, dismissal, transfer and promotion, changes in production techniques and in management policies, plant closings, and industrial safety. Expediting communication and promoting harmonious relationships are the major objectives of this approach. Both the *nemawashi* and joint-consultation practices prevail throughout the economy, not just in the unionized sector. See chapter 3 for additional discussions.

[4] The reader is warned against drawing any conclusions about which of the two countries is the odd man on the block. Many European countries, for example, have works councils (*Betriebsräte*) whose operations resemble Japan's joint consultation, and these countries appear to have more harmonious labor-management relations than the United States. Also, bonus payments exist in such countries as Belgium, West Germany, Italy, and the Netherlands to a greater extent than in the United States, though on average the proportion of bonus to total compensation is only about 10 percent in those countries—about half as large as in Japan. See chapter 3 for more details.

[5] For informative surveys of many of the recent developments in this literature, see Rosen (1985) and Parsons (1986).

[6] Note, however, that Akerlof and Miyazaki (1980) criticize implicit contract theories by demonstrating that they do not adequately explain layoff unemployment, as the proponents of these theories claimed. Also, just how rigid U.S. wages are seems to be controversial. Recent findings by

Stockman (1983), Bils (1985), and Hashimoto and Raisian (1987a,b) suggest that U.S. wages may not be as rigid as some have claimed. In contrast, there is little controversy surrounding the flexibility of Japanese wages.

[7] Nothing remains the same forever. There is evidence that job mobility may increase in Japan in the near future. See "Japan Cuts the Middle-Management Fat," *The Wall Street Journal*, 8 August 1989.

[8] Firm-specific human capital refers to factors such as technical know-how, skills, and organizational knowledge, which raise worker productivity in a particular firm more than in others. The concept was first formalized by Becker (1962). See also Hashimoto (1981) for an extension of the analysis.

[9] See, for example, Chinloy and Stromsdorfer (1987); *OECD* (1986); Freeman (1987); Koshiro (1986); Hart (1988); and Tachibanaki (1986).

[10] The transaction-cost literature stresses the importance of contract-specific capital – mostly physical capital – in generating *ex post* opportunistic behavior. Obviously, the same considerations apply to firm-specific human capital.

[11] The Labor Standards Law specifies that those who became *kyugyosha* through fault of their employer must be paid at least 60 percent of their usual pay (Japan Labor Standards Bureau 1988). The official description simply states that these are (1) workers who are absent from work but who received, or are to receive, wages or salary for time off, and (2) self-employed workers whose absence from work has not exceeded 30 days. See Japan Statistics Bureau, Management and Coordination Agency, *Annual Report on the Labour Force Survey* (1988), 196. According to table 27 of that publication, in 1988 fully 89 percent of these workers were in nonagricultural industries. Among those, the highest proportion were in services (28 percent), followed by manufacturing (22 percent), trade and eating and drinking establishments (22 percent), and construction (14 percent). The remaining workers were distributed thinly among fisheries, electric and gas supply, transportation and communication, and government. Almost 75 percent of *kyugyosha* in nonagricultural jobs, and over 81 percent in manufacturing, were employees rather than self-employed persons. Slightly more than 58 percent in nonagricultural pursuits and 50 percent in manufacturing were males. It appears, therefore, that most of these workers are *bona fide* members of the employed class in nonagricultural sectors. See Hashimoto (1990c) for related discussions.

[12] The Japanese data for the discussion of the employment categories are from Japan Statistics Bureau, Management and Coordination Agency, *Annual Report on the Labour Force Survey* (1988), tables 26, 27; and the U.S. data from the U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, Bulletin 2340 (1989), table 21.

[13] Employment contracts lasting for more than a year are illegal in Japan. Exceptions occur in cases where a project is known to end in, say, three years and craftsmen are hired for that duration, or when employers obtain special permission from their prefectural authority to put workers in on-the-job training programs.

[14] See Hashimoto (1979) and Freeman and Weitzman (1987) for analyses of Japanese bonuses.

[15] For example, the president of a medium-sized Japanese manufacturing firm told me that the same farmers from a certain farming region return to his firm year after year during off-seasons as temporary employees.

[16] There is, however, a growing temporary help industry in the United States. This industry is made up of establishments supplying temporary help to businesses, and currently accounts for about 1 percent of total nonagricultural employment. Also, the U.S. data categorize employment into part-time and full-time components. In 1988, 82 percent of nonagricultural wage and salary workers (16 years or older) worked at full-time jobs, though an additional 1.6 percent, who usually

work full time, worked at part-time jobs for economic reasons. In Japan, about 12 percent of employment consists of part-time workers, in contrast to the U.S. magnitude of 17 to 19 percent.

[17] In 1988, the labor force participation rate in Japan was 48.9 percent for women and 77.1 percent for men (for those 15 years and older). In the United States, the comparable rates were 56.6 percent and 76.6 percent, respectively, for women and men. The Japanese data are from the Japan Statistics Bureau, Management and Coordination Agency, *Annual Report on the Labour Force Survey* (1988), table 1; and the U.S. figures, from the U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 1.

2

A Theory of Investments in the Employment Relationship

Labor markets in Japan exhibit characteristics that are quite different from those in the United States. Three observations about the Japanese features motivate the theory discussed in this chapter. First, many of the Japanese labor market traits became pronounced only after the late 1950s when the Japanese economic growth began to accelerate.[1] The influences of tradition and culture alone, therefore, would seem to be insufficient for explaining why these features became consolidated and widespread at that particular time. Second, the same characteristics have not emerged in other countries that have experienced rapid economic growth. Obviously, economic growth alone cannot explain the postwar emergence of these Japanese features either. Third, the apparently cooperative character of Japanese industrial relations is not costlessly achieved, as management and labor spend a great deal of time, mental energy, and money on smoothing out relationships with each other.[2] Since this phenomenon has persisted for some time in many Japanese firms, the gains presumably justify the transaction expenditures.

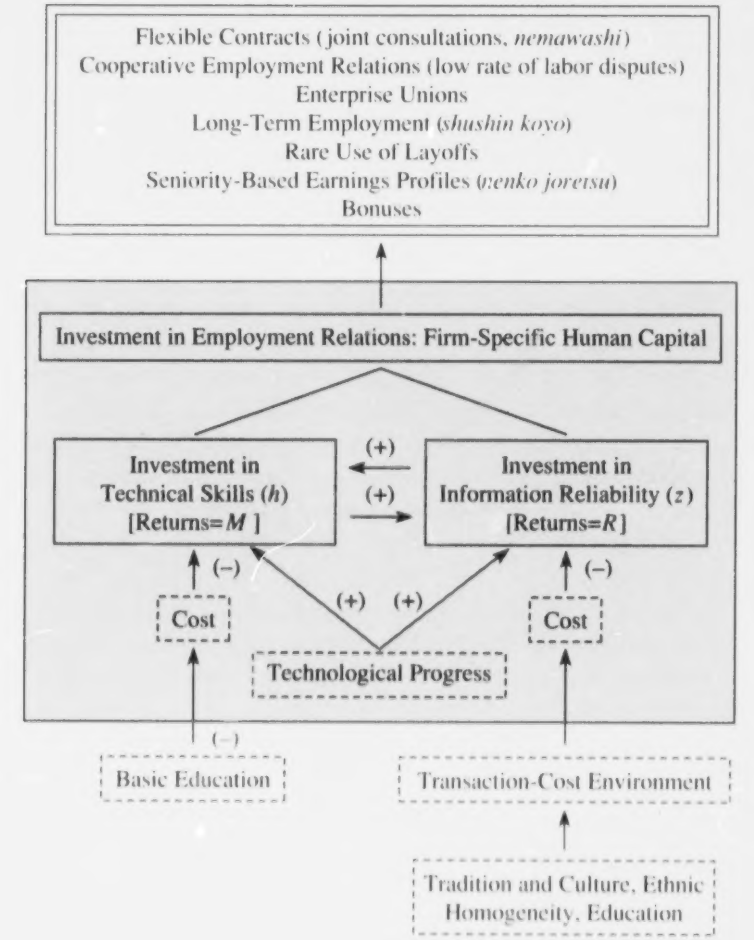
This chapter presents a theory for bringing the various labor market features into a unifying framework of analysis. Figure 2.1 summarizes the hypothesized relationships. The theory discussed in this chapter concerns the relationships shown in the shaded area. I argue that many of the observed labor market phenomena in Japan, indicated at the top of figure 2.1, reflect investments in the employment relationship or in what is known as firm-specific human capital, undertaken by its labor force. This investment consists of two separate parts, one in technical skills and the other in information reliability. Symbols are used in the text to represent various quantities, and they are shown in figure 2.1: the

amounts of capital created by the investments are indicated as h and z, and the returns from these investments by M and R, respectively. The variables h, z, M, and R are endogenous in the analysis; in other words, they are determined in the model. The effect on productivity of investing in the employee's technical skills is straightforward. The investment in the reliability of information promotes cooperative industrial relations by reducing mistrust, disputes, and inefficient decisions. An important result of the analysis is to demonstrate that the two investment components interact with each other: an increased information reliability stimulates the investment in technical skills, and vice versa.

Exogenous variables – variables determined outside the model – are the costs associated with the two investment activities. The cost of investing in technical skills is determined primarily by how well the formal education system prepares students for on-the-job training by instilling positive attitudes for learning and by teaching basic skills. The cost of investing in information reliability is determined by the transaction-cost environment, which in turn reflects the influences of tradition and culture, ethnic homogeneity, effectiveness of education in fostering workers' abilities to function cooperatively as a group, and worker propensity to change jobs.

Of particular focus in this study is the transaction-cost environment. Transaction costs are costs that Robinson Crusoe would not have incurred before he met Friday.[3] Transaction costs here connote the difficulty of communicating all sorts of information between employer and employees, and among employees themselves. These include the costs of convincing the relevant parties of the information's veracity. With low transaction costs, parties can respond flexibly to changing circumstances without having to undertake a costly verification of information. In contrast, high transaction costs reduce the reliability of information exchanged, discourage quick responses, and cause a dissipation of the gains from working together. Figure 2.1 indicates that the transaction-cost environment is shaped by, among other things, ethnic homogeneity. Indeed, it is sometimes claimed that the relative homogeneity of the Japanese population explains how firms are organized in that country

Figure 2.1 Hypothesis: Japanese Labor Market Phenomena



NOTE: The shaded area denotes the domain of the analysis in this chapter, and the symbols h, z, M, and R indicate the notations used for the respective magnitudes in the text. The (+) and (−) signs indicate, respectively, positive and negative influences.

(Aoki 1988, chap. 2). The theory discussed below suggests that this claim may have some validity.

Returns to and Scale of Investment in Technical Skills

Let us begin by laying out the building blocks necessary to construct the theoretical relationships in this model concerning the investment in technical skills. To develop the returns function associated with the investment in technical skills, it is necessary to discuss contract flexibility. The term refers to the degree to which contracts permit adjustments to newly emerging conditions. The ideal contract, completely flexible, would stipulate that *all* of the relevant new developments be incorporated immediately into contractual arrangements without rewriting the contract. The fixed, or rigid, contract would stipulate that *none* of the new developments be incorporated until the contract comes up for renewal. Between these extremes is the flexible contract, in which *some* adjustments to new developments are made automatically during the life of the contract.

For simplicity, let us assume that there are two periods in an employment relationship. In the first period, the employer and the employee decide how much to invest in the employment relationship and how to share the benefits of such investment. The sharing decision determines the employee's wage in the second period.[4] Investments are made with respect to firm-specific technical skills and to information reliability. At the beginning of the second period, relevant productivity information is revealed, and the parties decide to stay together or to separate.

A key aspect of the model is that in the second period there is a potential wealth loss caused by postcontractual (or *ex post*) opportunistic behavior. As Williamson has noted, the value of a transaction that is subject to *ex post* opportunism will be enhanced by devising *ex ante* appropriate safeguards (Williamson 1985, 48). In this model, the safeguards are the investment made in the reliability of information and the sharing arrangement for the benefit and costs of investments.[5]

Postcontractual opportunistic behavior may occur at the second pe-

riod because the values of the worker in the firm and outside inevitably are subject to information asymmetry: the employer is likely to be better informed about the value of the employee in the firm and the employee is better informed about his or her value outside the firm. As a result, the parties may have incentives to misrepresent their information. In particular, if the contract calls for sharing the realized value of the investment, the employer will have the incentive to understate the value of the employee's contribution, and the employee to overstate his or her outside productivity. As a result, the parties may engage in haggling and may even end up separating, even though they would be jointly better off not separating. Such separations are clearly inefficient.

The parties have the incentive to reduce the likelihood of wasteful haggling and of inefficient separations by optimally sharing the benefit of the relationship.[6] The parties make relevant decisions in the first period by comparing what they expect to be the value of the contract. They are assumed to have no difficulty in the first period agreeing on the probability distributions of the productivity outcomes: they share common knowledge about the past influences of business cycles and other sources of economic fluctuations. To characterize the contractual solutions chosen by the parties in an effort to minimize the adverse effects of information asymmetry, the model will be formulated in terms of wage flexibility. The analysis of flexibility along other dimensions, such as task assignments, promotions, and related personnel matters, will be similar in spirit, however.

We are now ready to discuss the relationships that underlie the investments in technical skills and in information reliability. The discussion will be kept to a nontechnical level, but a judicious use of symbols to represent the key building blocks of the theory will add concreteness to the argument.[7]

The building blocks are represented by the following symbols:

M^*: value of the ideal contract to the parties
M_1: value of the fixed-wage contract to the parties
M_2: value of the flexible-wage contract to the parties
σ : errors associated with the agreements about the productivities ($\bar{\sigma}$ is the parameter indicating the maximum amount of errors)

M: marginal returns to the investment in technical skills
h: quantity of technical skills
z: quantity of information reliability
R: total returns on the investment in information reliability

Suppose that the parties could freely agree on the realized productivity values. This situation would be as if the parties were a single individual, and there would be no transaction-cost-related problems. In particular, the ideal wage contract would be feasible, because each party's separation decision would follow exactly the efficient separation criterion, namely, that a separation takes place only when the employee's value elsewhere exceeded his or her value with the current employer.[8] Therefore, the distinction between layoffs (dismissals) and quits would be meaningless, as all separations would be mutually desired.[9] Let us denote the value of the employment relationship under the ideal contract by M^*. This value can be computed as the weighted average of the expected value of entering into an employment relationship that would accrue if the parties were not to separate and the expected value that would accrue if they were to separate, where the weights are the probabilities of not separating and of separating.[10]

If information is asymmetric, and if transactions are costly between the employee and the employer, the ideal wage contract will not be feasible. As noted above, the problem is that neither party may have the incentive to reveal his or her respective information truthfully to the other. To illustrate, suppose that the employer knows only the realized value of the inside productivity, and the employee only the realized value of the outside productivity. The parties in this case may face difficulties in communicating to each other their respective productivity values to determine the division of the gains from the relationship. Difficulties arise precisely because each party may have an incentive to misrepresent what he or she knows in order to increase his or her gains at the expense of the other.

Even with this difficulty, it is in the parties' interest to reach an agreement, however imprecise it may be. Employers want employees to accept their claims of employees' productivity; in turn, employees want

to persuade employers of the value of their outside productivity. Each, in turn, wants to verify the other's claim. Persuasion and verification take time and energy and are therefore costly. An agreement, however, will confer some gains by enabling the parties to respond to changing circumstances and, thereby, reduce the chances of making inefficient decisions. The gains from reaching an agreement may be large enough to justify incurring the cost of reaching such an agreement.

At one extreme, of course, an agreement may not be cost-effective: employer and employee may foresee that they will never be able to accept each other's claims of realized productivities. In this case, the natural thing to do is to agree in advance that the second-period wage will be determined solely in terms of the expected, or average, values of the productivities. The result is a fixed-wage contract, because the second-period wage is independent of the realized values of productivities.

In the fixed-wage contract, each party follows his or her own separation criterion, each being different from the criterion for an efficient separation. As a result, some inefficient separations inevitably occur. It should be noted, however, that, in this model setup, when a separation is efficient it will always take place.[11] The problem is that a separation may take place even when it is inefficient. The resulting efficiency loss reduces the value of this employment contract, and thereby reduces the incentive to invest in the relationship. Let us denote the value of the employment relationship under the fixed-wage contract by M_1.[12] Clearly, M^*, the value of the employment relationship under the ideal contract, is greater than M_1, since there are no inefficient separations associated with M^* (Hashimoto 1990b).

The parties could reduce the loss from inefficient separations if they were to agree on at least the approximate values of the realized productivities.[13] Whatever agreements they reach would be imperfect because the agreed-upon values would deviate from the true values – the deviations are referred to as errors of measurement, or just errors. The extent of the errors, denoted by σ in this model, would be greater the higher the transaction costs.[14] A contract that uses such agreements is a flexible-wage contract, and the value of the employment relationship is

denoted by M_2.[15] The value, M_2, turns out to have the following important relationship:

$$M_2 = M^* - f(\sigma),\ f(\sigma) \geq 0 \tag{1}$$

which indicates that M_2 is smaller than M^*, the value of the ideal contract, by the quantity $f(\sigma)$. The preceding discussion suggests that the quantity $f(\sigma)$ is zero if the errors, σ, associated with the agreement are zero, and increases if σ increases.[16] This last relationship is intuitively obvious: the larger σ, the higher the frequency of inefficient separations and therefore the greater the efficiency loss. Put another way, a reduction of σ, if that were possible, would increase M_2.

We now have the basic building blocks to construct the returns to the investment in technical skills. Assuming that the ideal contract is infeasible, the parties choose between the fixed-wage and the flexible-wage contracts by comparing the associated contract values. This choice problem can be expressed as:

$$M = \text{Max}\ (M_1, M_2), \tag{2}$$

which states that the value of entering into an employment relation, M, is either M_1 or M_2, whichever is larger. The resulting value of M constitutes the returns to investing in technical skills.

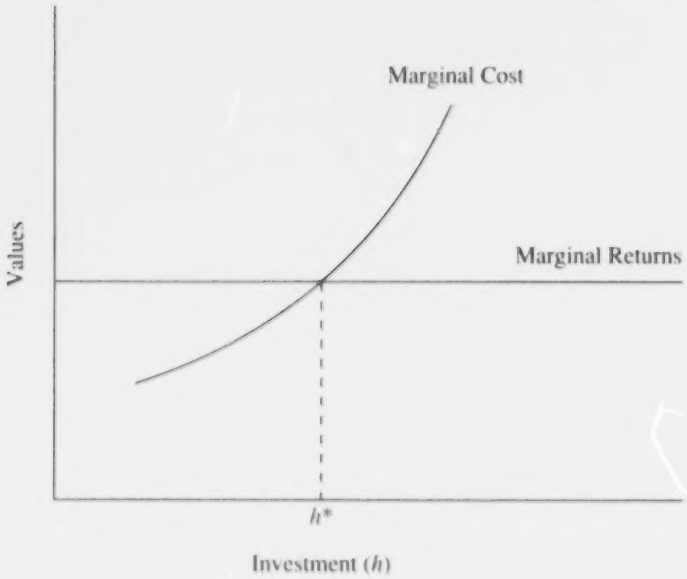
Consider the decision on how much to invest in technical skills. The quantity of technical skills created by the investment is denoted by h. The value per unit of h is M. Therefore, the optimum scale of h is determined by equating M with the marginal cost of producing h.

$$\text{Marginal returns } (M) = \text{Marginal cost}, \tag{3}$$

where the marginal cost of investment is assumed to increase with h. This cost is incurred at the time the contract is signed.

Figure 2.2 portrays the optimum decision: the optimum quantity of investment is determined to be h^*, where the marginal cost curve crosses the marginal return curve, M. Clearly, the optimum h will increase if either the value of employment relations increases so that M shifts upward or the marginal cost curve shifts downward, or both. In particular, suppose that a flexible-wage contract were chosen so that M

Figure 2.2 Optimum Investment in Technical Skills (h)



equals M_2. A reduction of errors, σ, would increase M, causing it to shift upwards in figure 2.2. As a result, the optimum h would rise. If a fixed-wage contract were chosen instead, so that M equals M_1, a reduction in σ would not affect M, and so the optimum h would not be affected either.

To summarize, optimum decisionmaking can be illustrated by the following scenario. Assume for the moment that the errors, σ, are exogenously given. First, given σ, the contract type and the associated value, M, are chosen by using equations (1) and (2). Then in figure 2.2, M is equated with the marginal cost to obtain the optimum h.

Investment in Information Reliability (Reduction in Inaccuracy)

In the analysis above, the reliability of information exchanged was assumed to be exogenous. Clearly, the parties may take steps to increase

information reliability by reducing the errors, σ. To achieve this goal, resources must be spent on screening job candidates, reducing the asymmetry of information, and, more generally, improving the quality of communication among employees and between management and workers. To incorporate these considerations into the model, it is necessary to treat σ as endogenous.

The parties are assumed to spend resources to reduce σ. I will refer to this activity as an investment in information reliability. The quantity of this investment is denoted by z, defined as:

$$z = \bar{\sigma} - \sigma, \; 0 \leq z \leq \bar{\sigma}, \tag{4}$$

where $\bar{\sigma}$ is the fixed parameter denoting the value of σ that would prevail if no resources were spent on reducing it. Equation (4) makes clear that an increase in z is equivalent to a reduction in σ. In other words, the larger the z the greater the reliability of information. The variable, z, is bound between zero and $\bar{\sigma}$: the smallest value of z is zero, which obtains when no resource is spent on reducing σ, i.e., σ is equal to $\bar{\sigma}$, and the largest attainable value of z is $\bar{\sigma}$, which occurs when σ is reduced to zero.

The total returns from investing in z is given by:

$$R = R(z, h) = Mh - (\text{cost of } h), \tag{5}$$

where R is the total return from investing in z, and Mh may be thought of as the total value (unit value, M, times the quantity h) of the employment relationship. Equation (5) states that R depends on z and h, with the term Mh revealing that z affects R via M because σ affects M. The preceding discussions make clear that R increases when z increases (i.e., σ decreases).[17] Finally, as in the case for the investment in technical skills, the parties face a cost function of investing in z.

The parties choose the optimum values of σ and h by maximizing the following objective function:

$$\pi = R(z, h) - (\text{cost of } z). \tag{6a}$$

By substituting equation (5) into (6a), one obtains:

$$\pi = Mh - [(\text{cost of } h) + (\text{cost of } z)]. \tag{6b}$$

The optimum values of h and z are determined from equation (6b) by satisfying the following two relations:

$$\text{Marginal returns from } h = \text{Marginal cost of } h, \tag{7a}$$

$$\text{Marginal returns from } z = \text{Marginal cost of } z. \tag{7b}$$

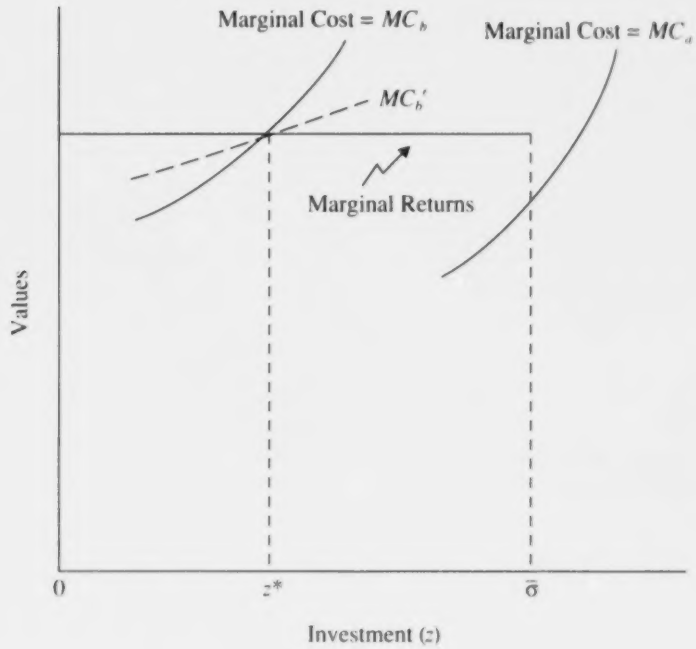
The optimum amount of h is determined from equation (7a) in the same manner as indicated in figure 2.2. Figure 2.3 illustrates how optimal z is obtained from equation (7b). To simplify, the marginal returns function for z is assumed to be linear.[18] The marginal returns become zero once z reaches the maximum value of the errors, $\bar{\sigma}$: there are no more returns to be had from investing in z once the errors are reduced completely. Two outcomes are depicted in figure 2.3, depending on the location of the marginal cost function. If the marginal cost is MC_a, the parties reduce σ entirely (i.e., $z = \bar{\sigma}$) and adopt the ideal contract. If the marginal cost is either MC_b or MC_b', the errors are reduced by z^*. (The difference between these marginal cost curves will be discussed in the next section.)

In a competitive equilibrium, the investment costs as well as the returns are shared between the parties to make the respective profit zero in the long run. Employees may pay for their share of the cost either by accepting a lower wage than their productivity warrants in the first period, or by paying an *entrance fee* at the time of employment.[19]

Discussion

The implications of the above model are straightforward. Other things being equal, lowering the marginal cost of investing in information reliability increases the investment in information reliability and, therefore, increases contract flexibility. An autonomous increase in technical skills stimulates the investment in information reliability as well as affects the choice of contract.[20] In particular, lowering the marginal cost of investment in technical skills, other things being equal, not only will increase the investment in technical skills but also the investment in information reliability by shifting upwards the marginal returns function in figure 2.3. Thus, it is possible for a fixed-wage contract to be chosen initially, but for a flexible-wage contract to be chosen later in response to an increased investment in technical skills.

Figure 2.3 Optimum Investment in Information Reliability (z)



This theory argues that the cost function associated with the investment in information reliability is shaped by the transaction-cost environment. In a lower transaction-cost environment one incurs lower marginal cost in increasing the reliability of information exchanged among team members. As a result, more is invested in information reliability and in technical skills. These investments promote cooperative industrial relations. I hypothesize that the transaction-cost environment in Japan has been more favorable to investing in information reliability than it has in the United States, and that this difference has played a role in many of the Japanese-American differences in labor market arrangements.

An interesting implication of the theory concerns the effects of

technological progress on the incentive to invest in the employment relationship. The effects of technological progress on Japanese investments in firm-specific human capital and earnings have received some attention in the literature (Tan 1987; Mincer and Higuchi 1988). Here, I identify the channel through which technological progress stimulates investments in human capital. A uniform productivity increase, widespread throughout the economy, may increase the incentive to invest in both technical skills and information reliability, as well as raise the likelihood that a flexible-wage contract is chosen. This possibility is best illustrated with a simple case of a neutral technological progress, by which the productivities of all activities rise in equal proportion throughout the economy.[21] In this case, it can be shown that the marginal returns functions in figures 2.2 and 2.3 shift upward. Costs of investments remain unaffected, as both the productivities and input prices rise in the same proportion.[22] As a result, investments in both technical skills and information reliability are increased, raising the likelihood that a flexible-wage contract dominates a fixed-wage contract.

An important point to note is that an increase in the investment caused by an upward shift of the marginal returns function is greater the more elastic—*flatter*—the cost function. In figure 2.3, for example, MC_b' is more elastic than MC_b. Clearly an upward shift of the marginal returns function would increase z more if the marginal cost were MC_b' than if it were MC_b. A similar argument can be made for the marginal cost function in figure 2.2. In a lower transaction-cost environment, the marginal cost function for investing in information reliability is likely not only to be lower in figure 2.3, but also to be more elastic. The greater cost elasticity in a lower transaction-cost environment underscores the fact that the parties could expand investment without incurring a sharp increase in the cost. What this analysis shows, then, is that an improvement in the returns stimulates the investment in information reliability more in a lower transaction-cost environment. In other words, an improvement in the returns interacts with the transaction-cost environment in affecting the investment.

It was noted elsewhere that low transaction costs alone cannot explain Japanese labor market phenomena, if only because labor turnover was

high in the early 1900s and early 1950s (Hashimoto and Raisian 1988). One naturally wonders why low transaction costs were not operating to reduce turnover during those years. We suggested then that a comprehensive understanding of Japanese labor markets may require an analysis of the interaction of economic growth and transaction costs rather than of their separate effects. The discussion above suggests that technological progress that accompanied economic growth may have interacted with the low transaction costs in bringing about many of the Japanese labor market phenomena.

In particular, the post-World War II prevalence of these phenomena in Japan can be interpreted as having been stimulated by the rapid economic growth and the technological progress that took place after the late 1950s. Such Japanese practices as joint consultation, consensus-based decisionmaking, and enterprise unionism became widespread after that period. This development coincided with the launch of a campaign to raise productivity and international competitiveness by importing modern technologies from the United States and Europe (Hashimoto 1990a).[23] The effort was coordinated by the Japan Productivity Center, established in March 1955.

Labor unions and leftist politicians initially opposed the campaign vigorously, fearing that modern technologies would displace labor and cause high unemployment. The drive eventually gained support from unions and politicians based on three principles: (1) to prevent unemployment of workers whose jobs would be made redundant by new technologies (the principle of job security); (2) to promote joint consultations between management and labor concerning the introduction of new technologies and related matters; and (3) to promote fair sharing of the gains of new technologies among employers, workers, and consumers.

Clearly, the prevention of unemployment and joint consultations have become firmly entrenched in the Japanese industrial relations system. The campaign helped guide private industries to acquire modern Western technologies, thereby contributing to the double-digit growth rate of the country's economy during the 1960s.[24] Given the historical background of the campaign, it is reasonable to view the economic growth

and technological change of the late 1950s as exogenous for my model, though the employment relations system eventually must have had feedback effects on economic growth subsequently.

The theory developed in this chapter may offer the key to understanding some of the Japanese industrial relations practices within the framework of the present theory. Japanese workers, on average, invest more in the employment relationship, and they have more flexible contracts, than American workers (Hashimoto and Raisian 1987a,b and 1988; Mincer and Higuchi 1988). Also, work organization and industrial relations in Japan are more flexible than in most other developed countries.[25] Flexible work organization is supported by the job-rotation system, whereby a typical worker is rotated among different tasks during his or her career so that he or she may acquire a wide range of skills (Koike 1984; Aoki 1988, chap. 2, 1989). The result is that workers become proficient in a multitude of tasks, a characteristic which facilitates a quick and flexible response to changes in work requirements and enables them to understand and correct the conditions giving rise to defective products and mechanical failure (Aoki 1988, 35–37). This way, the job-rotation system helps promote the zero-, or low-defect production process. The prevalance of these practices can be viewed as resulting from the low costs of investing in both technical skills and information reliability.

Large Japanese investments in information reliability are indicated by such time-consuming measures as joint consultation and consensus-based decisionmaking. The Japanese educational system instills in pupils skills and attitudes that promote effective group functioning and continuous learning as well as preparing them for such basic general skills as reading, writing, and arithmetic. As a result, the costs of investment in the employment relationship are likely to be lower in Japan than in the United States.

The relatively homogeneous labor force in Japan, along with an absence of the attitude of individualism, has been cited as being responsible for the cooperative industrial relations there.[26] Our theory would have to be extended to permit a comprehensive examination of this issue. Let me indicate how such an extension might proceed.

As is clear by now, investment in firm-specific human capital is a key factor behind cooperative industrial relations. Suppose that the degree of employee homogeneity refers to how similar the cost functions are among job applicants. Although our theory has been formulated in terms of a one-on-one employment contract, in reality an employer must negotiate with numerous employees. If employees were homogeneous, the employer could invest in technical skills and information reliability on the same scale for all employees. If the employees were heterogeneous, the employer might want to take into account individual differences and adopt different investment policies for different employees.

If the heterogeneity were large, however, it might be too costly to devise different investment policies for each and every employee.[27] In that case, a fixed-wage contract – fixed with respect to the realized productivity values and individual differences in them – might be chosen for all employees. Since such a contract inevitably reduces the gains from the employment relationship, the investment in firm-specific human capital would be discouraged. An extension along this line must also take into account the adverse selection problem as well. Employers would have to devise a mechanism by which job applicants sort themselves according to the costs functions.[28]

The Japanese employer typically screens job applicants with much care, a phenomenon that can be viewed as reflecting the attempt to homogenize the workforce.[29] A homogeneous workforce facilitates the adoption of a single investment policy. In this connection, it is interesting to note that quality control circles usually consist of homogeneous membership.[30]

Finally, the relevance of my theory at first glance may appear limited to the male career workforce in Japan – the so-called male regular workers, who typically have *lifetime employment*.[31] The theory is much more generally applicable than what such appearance would suggest, however. As pointed out in chapter 1, male regular workers have been a significant human resource in Japan, as regards the marketplace. Moreover, employment practices associated with this category of worker have served as models for other workers in Japan. For example, smaller firms in Japan try to emulate the industrial relations practices of large firms: investments in employment relations evidently occur among smaller

firms judging by the significant length of employment tenure among workers in small Japanese firms.[32] Therefore, knowledge about the employment relationship for male regular workers is crucial in understanding the performance of the Japanese industrial relations system. Also, temporary workers in Japan tend to work year after year for the same employers (see chapter 1). These workers in effect may have more than casual attachments to their employers. If so, they and their employers will have the incentive to invest in their employment relationships, though surely on a smaller scale than in the case of regular workers.

To test the theory presented in this chapter, it would be useful to have some direct evidence on the magnitude of transaction costs in Japan and the United States, but transaction costs are difficult to measure directly. As a result, the skeptical reader may be inclined to discredit any evidence offered in support of the proposition that transaction costs are lower in one country than in the other. The problem of not being able to observe certain variables in a model is not new. Indeed, the theory of human capital shares the same attribute in that such capital, or the gains and costs in the underlying investment decisions, is not directly observable. Human capital theory has proven highly useful in spite of this attribute because it has generated many testable propositions about labor market arrangements and offered a unified understanding of such phenomena as tenure-earnings profiles, labor turnover, and unemployment.

A useful theory is one that yields testable propositions, those that can potentially be rejected on the basis of observable phenomena. Viewed this way, the fact that transaction costs themselves are not directly observable is not a serious flaw of the theory developed in this chapter. The real issue is how useful this theory is in promoting an understanding of the labor market differences between Japan and the United States. The next two chapters examine the evidence that bears on the transaction-cost difference between Japan and the United States, as well as the cultural and economic conditions that are assumed by the theoretical argument just presented.

NOTES

[1] As will be seen in chapter 3, before World War II many of the contemporary features of the Japanese labor markets, such as long-term employment, bonus payments, and enterprise unions,

were not prevalent. An excellent glimpse into some aspects of the prewar labor market in Japan is contained in Taira (1970), Gordon (1985) and Odaka (1984).

[2] For example, it is well-known that workers of various ranks often spend several hours together during evenings, drinking and eating. These gatherings are designed to promote mutual understanding and to develop a consensus. The *nemawashi* procedure, whereby a consensus decision is slowly developed, also consumes time and energy.

[3] In this definition, information and transportation costs are not necessarily transaction costs. Steven Cheung offered me this informative definition of transaction costs several years ago. See also Cheung (1969).

[4] Thus, the issue under analysis is the determination of the second-period wage, which amounts to the same thing as deciding on the division of the returns to the investments. The first-period wage is determined in a straightforward fashion once the second-period wage is known from the zero-profit condition for a competitive equilibrium. See the discussion on competitive equilibrium later in this chapter.

[5] The determination of the sharing ratio was analyzed previously (Hashimoto 1979; 1981; Hashimoto and Yu 1980).

[6] This result is the famous sharing theorem in the human capital literature (Becker 1962; Hashimoto 1981). Inefficient separations occur when the parties separate from each other even though both taken together are better off not separating.

[7] The technical formulation can be found in my working paper (Hashimoto 1990b).

[8] In this model, the only source of inefficiency is the separation decision. An earlier discussion on this point appears in Hashimoto (1981).

[9] This proposition suggests a test of this theory. See chapter 4 for a detailed discussion of such a test.

[10] See the appendix, available upon request, for an explicit mathematical form for M^*.

[11] See Hashimoto (1990b) for technical details.

[12] M_1 can be computed as the weighted average of the expected values under the three mutually exclusive and exhaustive outcomes: no separation; no quits but separation; and dismissal, where the weights are the respective probabilities.

[13] The parties also may reduce the loss from inefficient separations by deciding on the optimum sharing of the returns to the investments. For an earlier discussion on this point, see Hashimoto and Yu (1980).

[14] For simplicity, errors associated with the agreements for inside and the outside productivities are assumed to be the same. This assumption is made only to simplify the expression without loss of generality. This assumption implies that the parties share equally in the returns to the investments. The derivation for this result is available from the author upon request.

[15] See Hashimoto (1990b) for the mathematical expression for M_2.

[16] In other words, $f(0)=0$ and $df/d\sigma>0$.

[17] Hashimoto (1990b) contains technical details.

[18] The assumption that the marginal returns function is linear turns out to be innocuous. See Hashimoto (1990b) for technical details on this point.

[19] The zero profit theorem states that both the worker's and employer's profits be zero. This is the familiar sharing theorem in firm-specific human capital (e.g., Becker 1962; Kuratani 1973; Hashimoto 1981).

[20] It can be demonstrated mathematically that the marginal revenue schedule in figure 2.3 shifts

upward as a result (Hashimoto 1990b). Thus, if σ has not already been reduced to zero, an increase in h will lead to a further reduction in σ.

[21] It seems innocuous to focus on a neutral technological progress, since one does not know which bias, if any, the actual technological changes contained.

[22] This argument is strictly correct if time is the only input in these activities. If nontime inputs are involved, and if their prices remain unchanged or even fall, costs will decrease, thereby reinforcing the positive effects on investments. The argument here is basically the same as the one advanced by Becker (1962) and later elaborated on by Welch (1970) regarding the effects of neutral technological progress on the incentive to invest in human capital.

[23] An extensive treatment on the history of this campaign appears in a report issued by Japan Productivity Center (1988). I am grateful to Haruo Shimada for bringing my attention to this publication, which is unavailable to the general public, and sending me a copy of it.

[24] The activities of the campaign included conferences and seminars in which top-level industrialists, bankers, scholars, and bureaucrats participated; numerous visits by Japanese managers and unionists to the United States and Europe, as well as visits by Western specialists to Japan; and active information dissemination. Between 1955 and 1956, for example, 42 missions, involving 481 members, were sent to observe various U.S. industries. See Japan Productivity Center (1988, chap. 4).

[25] Tachibanaki (1986) contains a useful comparison of labor market flexibility in Japan, the United States, and Europe.

[26] Japan is remarkably homogeneous in race, ethnicity, religion, and culture. Cole (1980, 25) argues that Japanese managers view the average worker as not so different from themselves and that this attitude is critical in understanding the willingness of these employers to invest in the training of, the provide responsibility for, blue-collar employees. Aoki (1988, chap. 2) notes that the ethnic homogeneity of Japanese workers may have been a crucial factor in the development of the typical Japanese organization of firms.

[27] One way to mitigate the problem of employee heterogeneity is to screen job candidates. Japanese employers, particularly those in large firms, are known for the care with which they screen new hires. The screening device includes extensive background checks and exclusive reliance on selected schools from which to recruit. Shimada (1988, chap. 2) reports that American workers who were hired at Honda in Ohio also reported having gone through lengthy interviews in the presence of executives and vice presidents. As will be discussed in chapter 5, my preliminary research also has revealed that some of the Japanese automobile transplants engage in a much more intensive screening of job applicants than do their parent companies. (See *Business Week*, October 3, 1989, for similar evidence on an intensive screening at Mazda in Michigan and Diamond-Star [a joint venture between Chrysler and Mitsubishi] in Illinois.) Sorting employees into subgroups may be another way of reducing the number of different policies that must be devised. Sorting is costly, however. A full analysis of this consideration would take us into the issues of hierarchical structure in firms and the optimum number of departments within organizations.

[28] Such an analysis might follow the approach by Miyazaki (1977) on the structure of wage contracts offered to heterogeneous workers.

[29] Some Japanese automobile transplants in the U.S. Midwest tend to emphasize the screening of job applicants much more than do their parent companies. This tendency is understandable, given the greater heterogeneity of the American than Japanese labor force. See chapter 5 for a related discussion on the Japanese transplants.

[30] See chapter 3 for quality control circles. It should be noted that population heterogeneity *per se* doesn't lower transaction costs. Rather, the homogeneity in work attitudes, willingness to learn

skills, and ability to function cooperatively in a group are what matter. See chapter 5 for a related discussion.

[31] In 1988, male regular workers constituted 59.8 percent of all employees, and 94.6 percent of all male employees, in the nonagricultural sector. (The comparable figures for females were 29.7 percent and 80.6 percent, respectively.) Although the data are not available, the value of output produced by male regular workers is certain to be large in Japan.

[32] According to Hashimoto and Raisian (1985), median years of tenure among workers in small firms (one to 9 employees in Japan and one to 25 employees in the United States) are eight and two years, respectively, for the two countries.

3

Macroeconomic and Institutional Conditions

Chapters 3 and 4 discuss the evidence that bears on the theory presented in chapter 2. This chapter focuses on macroeconomic and institutional conditions that provide the background for the theoretical argument in chapter 2, and the next chapter addresses the theory's implications.

This chapter discusses some facts regarding differences in labor market behavior between Japan and the United States, and emphasizes features regarded as unique in Japanese industrial relations. Rather than being an exhaustive treatment, the discussion concentrates on the economic and cultural conditions that underlie the book's theme, i.e., the interaction of tradition and culture with economic growth in shaping labor market institutions.[1]

After examining the historical origins of some of Japan's labor market features, the chapter concludes that an explanation based on historical continuity in the institutions of Japanese industrial relations is an incomplete one for the country's postwar labor market. Japanese employment and wage systems as we know them today were not prevalent before World War II. It was not until the early 1960s that such systems became widespread throughout the economy. This and other related considerations suggest that the influences of culture and tradition alone are not responsible for the Japanese employment and wage systems. Instead, a plausible explanation suggests that culture and tradition interacted with economic growth in shaping these systems.

Macroeconomic Comparisons

Let us begin by comparing the recent macroeconomic performances of Japan and the United States, focusing on productivity growth rates

and unemployment rates. It will be made clear that, measured by these indicators, Japan has been experiencing greater improvement in economic performance than the United States in recent decades.

Output and Productivity Levels and Growth Rates

One might easily get the impression from the popular press that the Japanese economy is far more productive than the American. Such an impression is not accurate: as of the mid-1980s, the United States enjoyed an overall advantage in productivity levels. Consider that, in 1985, the gross national product per labor force member was a shade below $34,000 for the United States and a little over $22,000 for Japan, a difference of about 51 percent. The average hourly earnings for a production worker in manufacturing in 1985 were $9.52 in the United States and $6.03 in Japan, a difference of almost 58 percent.[2] Needless to say, such crude aggregate measures conceal productivity differences among sectors. According to Jorgenson and Kuroda (1990), in 1985, of the 28 industrial sectors studied, 16 showed productivity gaps in America's favor, 10 in Japan's favor, and 2 showed the two countries to be about equal.[3]

There are, of course, some industries in which Japan excels. Drucker (1990) notes that Japanese automobile plants of Honda, Nissan, and Toyota turn out 2 to 3 times more cars per worker than comparable American or European plants.[4] Abegglen and Stalk (1985) note that high Japanese productivity is limited to certain types of manufacturing processes. In general, they note, the Japanese labor productivity advantage is enormous in high-volume assembly processes where a huge number of interdependent steps must be coordinated, but in simpler processes, the Japanese advantage is small.[5] They go on to state:

> . . . despite all that is said about management style and organizational effectiveness, Japanese organization in such fields as services and distribution have low levels of productivity (p. 65).

The above remark is particularly noteworthy since the relative importance of the service sector is growing in the economies of both countries.

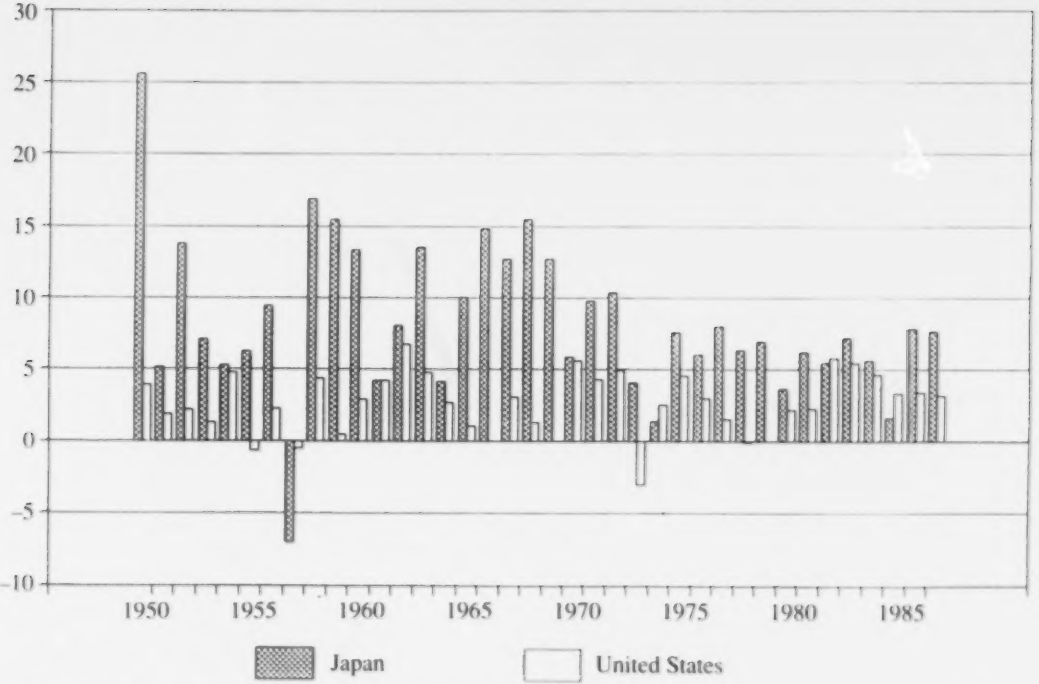
This development by itself portends a widening gap in the productivity level between the two countries in favor of the United States.

What is striking is not the difference in the level of productivity between the countries, but rather the difference in the growth in productivity in Japan's favor during the post-World War II years. Consider, for example, the contrasts in the output growth rate in the manufacturing sector. Japanese real output in that sector grew at an average annual rate of a little over 10 percent during the period from 1950 to 1988, while the U.S. real output grew only at about 3.5 percent. Figure 3.1 portrays the movement in the growth rate of output-per-hour – a standard measure of productivity – in manufacturing between 1950 and 1986. Clearly, productivity growth in manufacturing was greater on average in Japan than in the United States.[6]

There has been a narrowing of the differential in productivity growth rates between the two countries in recent years. As is well-known, the growth rate of Japanese real GNP fell from double-digit levels during the 1960s to a rate of around 5 percent in the 1970s and 1980s. In contrast, GNP for the United States has grown at an annual rate of only about 3 percent throughout the same three decades. As a result, the differential in the growth rates between the two countries narrowed considerably during the 1970s and 1980s. In manufacturing, the output growth rate has become rather similar in the two countries.[7] The fall in the growth rate in Japan reflects the rather low growth rates experienced during the 1985–87 period caused by the rising value of the yen.

According to Jorgenson et al. (1987), Japan's higher rates of growth in capital and intermediate inputs were largely responsible for the greater growth in the country's output between 1960 and 1979. Growth in these inputs, in turn, must have raised labor productivity. In fact, differential growth in labor productivity rather than in labor supply appears to have been the key factor in the difference in output growth between the two countries. For example, the civilian labor force grew steadily in Japan after 1960 at an annual rate of about 1.2 percent, well below the corresponding U.S. figure of 2.2 percent. As of the early 1980s, the growth in real GNP per labor force member (a measure of productivity) was about 4 percent in Japan and 1 percent in the United States. In

Figure 3.1 Annual Growth in Output-Per-Hour (%)
Manufacturing



SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 146.

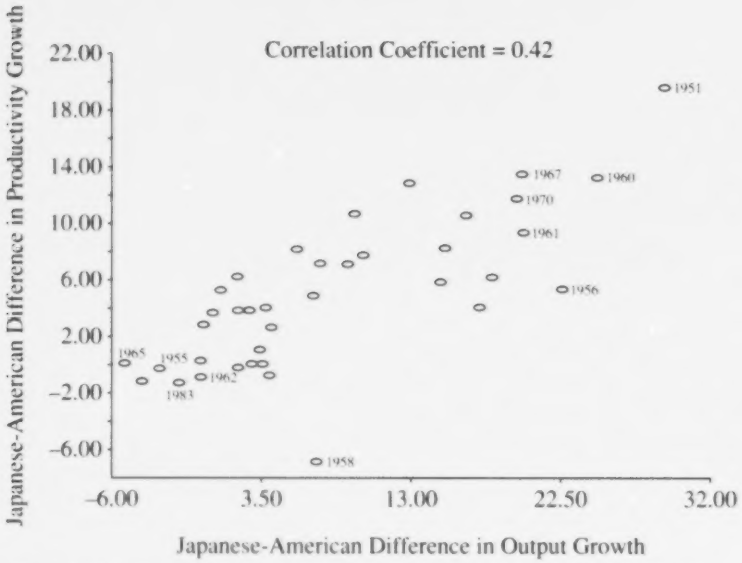
manufacturing, the growth in real output-per-hour held steady in the United States at about 2.6 percent per year, while in Japan it declined from about 10 percent in the 1950s to about 7.5 percent in the early 1980s. Even with the declining trend, the growth rate of Japanese labor productivity remains higher than the U.S. growth rate.[8]

How closely is the difference in output growth related to the difference in the growth of labor productivity? To shed light on this question, figure 3.2 presents a scatter diagram relating Japanese-American contrasts in productivity growth (vertical axis) and output growth (horizontal axis) during the period from 1951 to 1988. This figure clearly shows a positive association between the two difference measures, and the correlation coefficient of 0.42 indicates the strength of this association. This correlation coefficient suggests that over 17 percent (square of 0.42) of the contrast in the growth rate of manufacturing output is accounted for by the difference in the growth rate of productivity between the two countries.

The discussion above is based on a simple correlation derived from figure 3.1. A fuller analysis would require a multivariate technique. Towards this end, I used the data for 28 manufacturing industries reported in Jorgenson et al. (1987, table 2) to estimate a regression of the output-growth difference between Japan and the United States on growth contrasts in labor, capital, and intermediate inputs. The results indicate that growth differences in capital and intermediate inputs had statistically significant influences on output-growth difference, but that the growth contrast in labor inputs did not. This finding amounts to indirect evidence that growth difference in labor productivity has had a significant influence on growth difference in output between the two countries.[9]

Finally, it should be remembered that the conventional measure of output may not reflect the true measure. For example, the hypothesis of this book implies that Japanese workers spend more hours on job-related activities than reported hours of work would indicate. This implication in turn might be used to infer that the measured productivity, i.e., output-per-hour, overstates the true productivity. Such an inference must be drawn with caution, however, since the data on output are imperfect.

Figure 3.2 Japan-United States Differences (1951–88) in Manufacturing Performance



SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 146.

The investment of time by Japanese workers must pay off in terms of a more comprehensive measure of output, for example, including the quality dimension; otherwise, the country wouldn't be so successful in the international marketplace. The question remains open, however, as to whether or not Japanese workers have been investing too much of their time. Perhaps, it will become possible to deal with this question in the near future as we observe the effects of the country's recent movement to shorten work hours.

Unemployment Rates

We now turn to the comparison of unemployment rates as indicators of labor market performance. As is well-known by now, unemployment

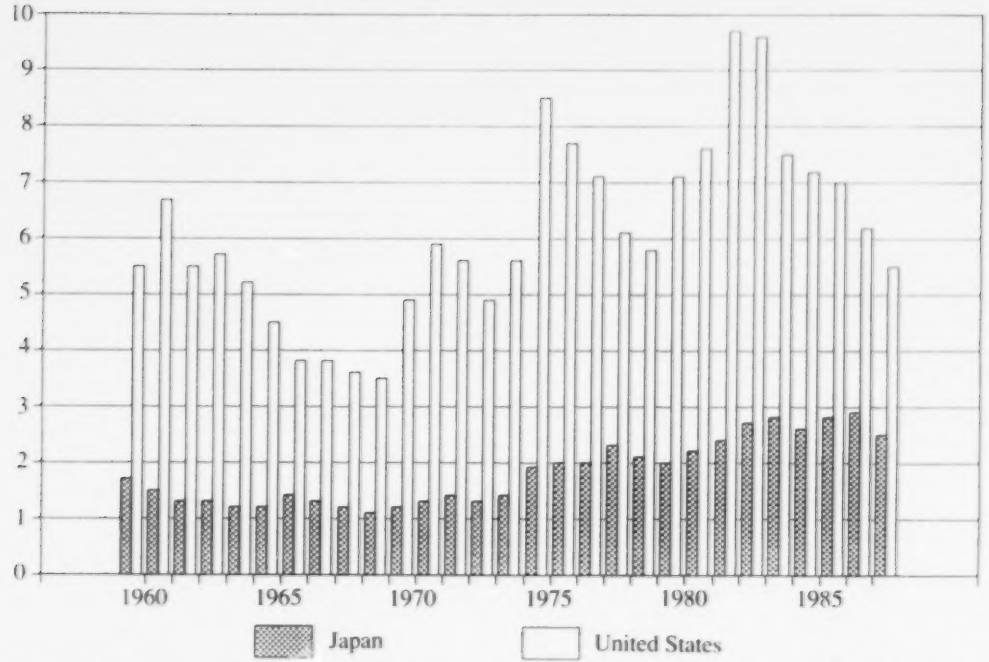
rates are higher in the United States than in Japan. As figure 3.3 indicates, unemployment rates in both countries trended upwards through the mid-1980s. Why are unemployment rates so persistently low in Japan? Let me outline some of the major factors responsible for the unemployment rate difference between the two countries. An exhaustive analysis of this question, which would require the construction of an unemployment series for Japan on a comparable basis with the U.S. series, is beyond the scope of this book.[10]

The U.S. Bureau of Labor Statistics reports Japanese unemployment rates modified to conform to the U.S. definition.[11] In particular, unpaid family workers working fewer than 15 hours per week are excluded from the employed category for Japan, just as they are in the U.S. definition.[12] Even with the BLS modifications, the adjusted and the original Japanese unemployment rates differed little for the 1959–88 period.[13] The similarity between the original and modified series suggests that the adjustment procedure, for whatever reasons, ignored many of the important conceptual and labor market differences between the two countries. Below are some of the relevant factors that the adjustment evidently did not take into account.

An important reason for the unemployment rate difference, in my opinion, is that separations are much fewer in Japan than in the United States. In Japan, employers try to avoid outright dismissals or disciplinary dismissals.[14] Employers dismissing workers for reasons of poor economic conditions potentially face high costs of doing so. Should the dismissed workers sue, the courts determine the validity of dismissals for economic reasons by examining how grave the firm's financial situation was, and whether the employer made serious efforts to avoid dismissals by using other means.[15] Perhaps for this reason, the separations that do take place tend to be quits or retirements rather than layoffs or dismissals. Figures 3.4 through 3.6 indicate that the rate of separations is lower and that the ratio of quits to dismissals higher in Japan than in the United States.[16]

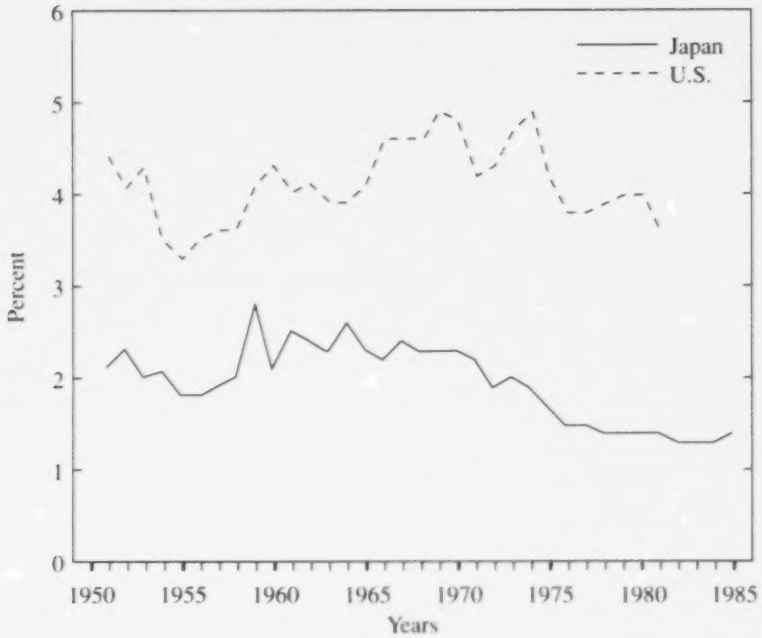
The two countries also differ in the treatment of laid-off persons and the job search period stipulated in the unemployment definition. In Japan, persons on layoff awaiting recall (*ichiji*, or temporary, *kyug-*

Figure 3.3 Unemployment Rates (%)



SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 143. The BLS publishes foreign unemployment rates, adjusted to conform to U.S. concepts and definitions.

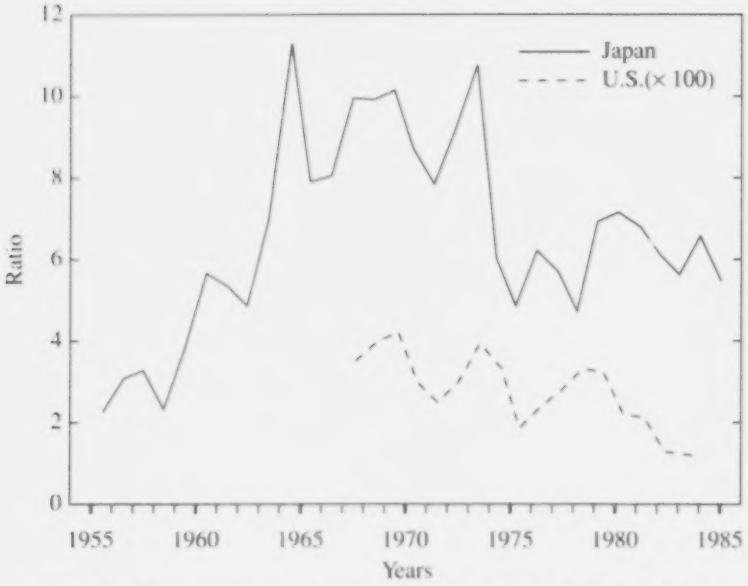
Figure 3.4 Rate of Separation: Manufacturing



SOURCES: The Japanese rate of separations are annual averages of monthly labor turnover data from the Maigetsu Kinro Tokei Chosa (Monthly Labor Survey), as reported in Japan Policy Planning and Research Department, Ministry of Labour, *Yearbook of Labour Statistics*, various years. The U.S. data are from the Bureau of Labor Statistics, *Employment and Earnings*, various years, and are also annual averages of monthly labor tunover data. The data are available only for manufacturing. The U.S. series was discontinued as of 1981.

yosha) are classified as employed, while in the United States they are counted as unemployed. Even if laid-off persons were to be counted as unemployed in Japan, however, unemployment rates would be increased by only about 10 percent, and this would not alter the substantial difference in unemployment rates between the two countries.[17] The main reason layoffs fail to narrow the gap more is that they typically amount to only about 0.2 percent of the labor force, as compared to about 1.0 percent in the United States.[18] Layoff is simply not as common a practice in Japan.[19] Ito (1984, table 2) also found that the differential

Figure 3.5 Ratio of Quits to Dismissals (Layoffs)
All Industries

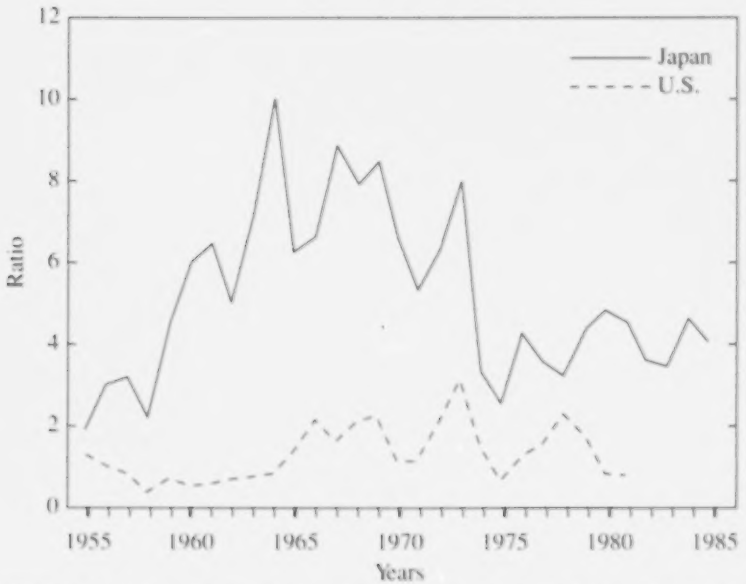


SOURCES: The Japanese data are from the *Koyo Doko Chosa* (Survey on Employment Trend), as reported in Japan Policy Planning and Research Department, Ministry of Labour, *Yearbook of Labour Statistics*, various years, and refer to employees separated during the year, cross-classified by reasons for separation. The U.S. data for all industries are from the U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1985), table 32, and pertain to unemployed persons by reason for unemployment (job-losers vs. job-leavers). For manufacturing, the U.S. data are the ratio of the quit and layoff rates from the U.S. Bureau of Labor Statistics, *Employment and Earnings*, various years, figure 5. U.S. data collection for manufacturing turnover was discontinued as of 1981 for budgetary reasons.

incidence of temporary layoffs accounts for about 25 percent of the unemployment rate differences between the two countries in recent years.

Another difference relates to the duration of job search activity used to define the state of unemployment. In the United States, anyone who has searched for a job during the four-week period preceding the survey date is counted as unemployed, but in Japan only those who have looked

Figure 3.6 Ratio of Quits to Dismissals (Layoffs) Manufacturing



SOURCES: The Japanese data are from the *Koyo Doko Chosa* (Survey on Employment Trend), as reported in Japan Policy Planning and Research Department, Ministry of Labour, *Yearbook of Labour Statistics*, various years, and refer to employees separated during the year, cross-classified by reasons for separation. The U.S. data for all industries are from the U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, (1985), table 32, and pertain to unemployed persons by reason for unemployment (job-losers vs. job-leavers). For manufacturing, the U.S. data are the ratio of the quit and layoff rates from the U.S. Bureau of Labor Statistics, *Employment and Earnings*, various years. U.S. data collection for manufacturing turnover was discontinued as of 1981 for budgetary reasons.

for jobs during a single reference week qualify as unemployed. As a result, the Japanese definition excludes from the unemployed category those who engage in job search activity infrequently, whereas such persons are more likely to be counted as unemployed in the United States. According to Hamada and Kurosaka (1984, table 2), an adjustment for this definition difference would raise the Japanese unemployment rate only a little for males but by about 55 percent for females,

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presumably because females are more likely to engage in discontinuous search activity.

There are notable differences between the countries in unemployment and labor force activity for youths – those younger than 25 years of age. As Raisian and I have found, not only are there twice as many youths in the labor force in the United States as in Japan, but they are also more likely to be unemployed than their Japanese counterparts (Hashimoto and Raisian 1988). As a result, the U.S. unemployment rate for adults, excluding youths, was only about twice as high as the rate in Japan in 1979, but the overall U.S. unemployment rate was three times higher than the Japanese rate.[20]

To summarize, the evidence on productivity growth and unemployment indicates that Japan indeed has experienced a relatively high level of economic performance in recent decades. The growth rate in productivity remains higher in that country, though the difference with the United States has narrowed in recent years. As for unemployment rates, a significant contrast persists between the two countries even after adjusting for differences in layoffs, length of job search, and labor force composition, or even after counting all of the *kyugyoshas* as unemployed persons. The unemployment rate difference narrowed in the late 1980s, when Japan experienced rising unemployment rates caused by the strengthening of the yen as the United States enjoyed falling unemployment rates.

Labor Market Institutions and Practices

There are many interesting labor market institutions and practices in Japan that bear on the theory developed in chapter 2. This section will focus on mandatory retirement practices, industrial relations practices, unionism, and the importance of labor disputes, as well as on the historical and cultural background of some of the Japanese labor market practices.

Table 3.1 Private Sector Firms with Mandatory Retirement Systems in Japan

(1)	(2)	(3)	(4)	(5)	(6)	
		Firms with Uniform Retirement Arrangements*				
	Percent of		Percent with Retirement Age of:			
Year	All Firms	Percent**	Age 55	Age 56–59	Age 60	Age > 60
All Firm Sizes (30 or More Employees)						
1967	–	–	63.2	14.2	20.6	1.5
1974	66.6	65.7	52.0	12.3	32.4	3.0
1980	82.2	73.0	39.5	20.1	36.5	3.2
1989	88.5	93.0	20.7	17.0	57.6	4.3
Giant Firms (5,000 or More Employees)						
1964	–	–	74.5	21.7	2.8	0.0
1974	100.0	69.9	38.0	51.0	11.0	0.0
1980	99.5	79.4	35.3	37.1	27.6	0.0
1989	99.1	94.2	4.9	8.7	86.4	0.0
Large Firms (1,000–4,999 Employees)						
1964	–	–	80.0	14.7	5.4	0.0
1974	99.0	55.8	42.7	37.4	19.2	0.7
1980	99.9	70.6	38.9	36.5	22.8	1.7
1989	99.8	95.9	10.4	14.5	74.0	1.1
Medium-Sized Firms (300–999 Employees)						
1964	–	–	77.7	11.0	10.3	0.6
1974	94.3	60.9	49.5	27.7	22.1	0.7
1980	98.3	70.5	45.1	28.6	25.1	1.0
1989	99.6	93.3	15.6	19.0	62.8	2.6
Moderate-Sized Firms (100–299 Employees)						
1964	–	–	71.7	7.0	18.1	1.3
1974	90.4	59.8	53.4	17.0	26.9	2.6
1980	93.7	70.3	44.4	22.3	30.8	2.4
1989	96.2	92.4	20.0	18.5	57.9	3.4
Small Firms (30–99 Employees)						
1964	–	–	75.0	4.8	18.9	1.2
1974	55.0	70.1	52.3	6.4	37.3	3.7
1980	76.5	74.5	37.1	17.7	40.4	3.7
1989	84.8	93.0	21.8	16.3	56.4	4.8

SOURCES: Japan Productivity Center, *Katsuyo Rodo Toket* (Practical Labor Statistics) 1990; Sangyo Rodo Chosa Sho (Research Agency for Industrial Labor) Chingin Choki Keirei 50 Nen (The 50-Year Long-Term Wage Series) 1988.

* Firms without any discriminatory (by sex, for example) retirement systems.

** Firms with uniform retirement system relative to all firms with mandatory retirement systems.

Mandatory Retirement and Labor Force Participation of Older Workers

Unlike the case in the United States, mandatory retirement has been gaining popularity in Japan (table 3.1, column (2)). Larger firms use mandatory retirement more frequently. Column (3) shows that Japanese firms in increasing proportion have moved away from discriminatory (by sex, for example) retirement practices.[21] Thus, the proportion of firms with a uniform retirement system, in the population of all companies using the mandatory retirement system, has risen for firms of all sizes. Most mandatory retirement used to take place at around age 55, but the retirement age has been advancing: by the late 1980s, the majority of firms with uniform mandatory retirement systems retired workers at age 60 or older (columns (4) through (6)). Interestingly, the proportion of firms retiring workers at ages greater than 60, conditional on companies having mandatory retirement, tends to be higher in smaller firms (column (6)). An inspection of columns (4) through (6) reveals that this tendency may be a reflection of smaller companies having a greater dispersion in the distribution of the mandatory retirement age.

It is noteworthy that the U.S. mandatory retirement age of 65 years in the recent past is higher than the average Japanese retirement age of approximately 60.[22] This difference would appear contrary to the pattern predicted by the argument that Japanese workers invest more in firm-specific human capital than U.S. workers: one would expect workers with more firm-specific human capital to stay longer with their firms. The determination of the retirement age reflects many factors, including longevity and worker productivity, so that a comparison of the age level may not be meaningful. For example, life expectancy was lower in Japan than in the United States in the 1950s when the retirement age of 55 years became prevalent.[23] The fact that the age of mandatory retirement has been increasing in Japan may reflect the increasing life expectancy, among other factors, but it is also consistent with the human capital hypothesis if firm-specific human capital has been increasing there.[24]

Why is there a mandatory retirement system in Japan, and why has the typical mandatory retirement age been increasing? One finds three explanations in the literature for the mandatory retirement practice. The first argument hinges on the idea that senior workers near retirement receive wages higher than their current productivities. For example, in Lazear's (1979, 1981) work-effort model, senior workers are *overpaid* relative to their current productivity to compensate for their having been underpaid when they were junior workers. Such a payment scheme is designed to reduce shirking and other unproductive behaviors. In effect, workers post bond in earlier years, receive the interest payments over the years as part of their wages, and reclaim the bond at the time of retirement.

Senior workers may also be overpaid as part of the promotion-ladder scheme to reduce inefficient separation of workers who receive training in firm-specific human capital (Carmichael 1983a). In this scheme, sometime after the training is completed, workers are promoted to wages that exceed their current productivities on the basis simply of seniority. This arrangement eliminates the employer's incentive to dismiss a trained worker prematurely: the employer does not gain from such action because another trained worker will fill the vacated slot on the basis of seniority. Eventually, there comes a time when it is efficient to separate, either because worker productivities have fallen or the values of their leisure time have risen to make it inefficient for them to remain employed. In both Lazear's and Carmichael's models, the workers have the incentive to continue being employed, since their wages are higher than their productivities. Thus, mandatory retirement must be imposed to effect efficient separations.

The second argument, the productivity-dispersion hypothesis, argues that the dispersion in individual productivities increases with age for health reasons (Oi and Raisian 1985). Measuring, sorting, and reassigning become unprofitable for older workers, who decline in productivity and whose remaining working lives are short. Therefore, it becomes economical to retire all workers when they reach a certain age rather than to ascertain which of these workers are worth keeping.

The third argument for a mandatory retirement system hinges on the

heterogeneity in the age of hire (Parsons 1988). Parsons claims that mandatory retirement is designed for those who are hired late in life. Because of cost considerations, employers and incumbent workers may be unable to prevent those newly hired old workers from sharing in the rents – wages that exceed worker productivity – which typically accrue to those with seniority. Mandatory retirement is a way of limiting the newly hired old workers from sharing in the rents, according to Parsons.

For young new hires, Parsons argues, mandatory retirement is unnecessary because age-based pension plans can be designed to induce them to retire at an optimum wage. He finds evidence that in the early 1970s U.S. workers with low tenure in late middle age, who presumably had been hired late in life, had stronger desire for working beyond the mandatory retirement age of 65. Parson's hypothesis may explain why mandatory retirement is more prevalent in larger firms.[25] The prediction of this hypothesis appears to conflict with the situation in Japan, however, where the age of hire tends to be homogeneous but mandatory retirement takes place nevertheless, and it, in fact, has become increasingly popular.

Let me note three possible factors behind the rise in mandatory retirement age in Japan. First, as mentioned above, an increased investment in firm-specific human capital may apply. Second, an environment of rapid technological change – where skills become obsolete quickly, thereby necessitating retraining – may lower the optimum mandatory retirement age. It may not be profitable to keep retraining older workers whose remaining working life is short.[26] This argument may be relevant for explaining why the mandatory retirement age has risen in Japan, as that country's pace of economic growth and technological change has slowed in the 1970s and 1980s. The technological factor may also be relevant for the Japanese-American contrast if technological progress has slowed more in America than in Japan. The elimination of mandatory retirement in the United States effectively raised the mandatory retirement age infinitely. Third, a demographic trend may apply. The rapid aging of the labor force in recent years surely must have exerted pressures to accommodate aging workers by extending their working years.[27] Note that the demographic pressure has been greater in Japan.

In the United States, those over 60 years amounted to a little under 16 percent of the total population in 1980, but by 1988 their proportion had grown by 6.5 percent. In Japan, the comparable proportion grew by nearly 27 percent, from 13 percent in 1980 to 16 percent in 1988.[28] The question that remains unanswered, therefore, is why more Japanese firms are adopting the mandatory retirement system in the first place, rather than doing away with it in response to the demographic pressure. An interesting topic for future research is why mandatory retirement has been gaining popularity in Japan, with the retirement age steadily rising, while it has been eliminated in the United States albeit by legislation.

A related issue is the Japanese redundancy practice, whereby many Japanese firms tend to separate senior and trained workers through discharge and early retirement when demand declines.[29] This practice has raised the concern that experienced and productive workers are being forced out of employment, causing a large loss to the economy (Koike 1987). This practice, however, may be an employer's rational response to a demand decline.

Carmichael (1983b) shows that it is less costly to lay off older, experienced workers than young workers who are in the process of receiving training. The reason is straightforward: a layoff does not shorten the time required for training, but it does reduce the total working lifetime of a worker. Thus, the productivity loss is always from an experienced worker whose lost output is evaluated at the current depressed product price. For a young worker in training, his or her lost output is evaluated at a price averaged over good and bad times. As a result, the expected value of a young worker's training is less sensitive to current economic conditions than the actual value of an experienced worker's training.[30] Thus, while not ruling out the possibility of waste caused by the redundancy practice, Carmichael's argument does suggest that this practice may be a rational one.

Even with the prevalence of mandatory retirement, the labor force participation rates of older workers remain higher in Japan than in the United States (table 3.2). For example, almost 36 percent of Japanese males who are 65 years of age or older were in the labor force in 1988, while only about 17 percent of U.S. white males in the same age group

Table 3.2 Labor Force Participation Rates for Older Workers in Japan and the United States (1988)

Age	Males (%)	Females (%)
Japan		
50–54	96.0	63.3
55–59	91.3	50.9
60–64	71.1	38.6
65 and older	35.8	15.7
United States (Whites)		
55–64	67.9	43.6
65 and older	16.7	7.7

SOURCES: Japan Statistics Bureau, Management and Coordination Agency, *Annual Report on the Labour Force Survey* (1988), table 2; U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, Bulletin 2340, (August 1989), table 5.

were in the labor force. Japanese women often enter the labor force after their husbands retire. Table 3.2 indicates that almost 16 percent of Japanese females who are 65 years or older, in contrast to the less than 8 percent for comparable U.S. white females, were in the labor force in 1988.

Many of Japan's retired male workers continue to work in the same firm at reduced pay, or they may find employment in subsidiary and subcontracting firms. In 1988, 89.5 percent of nonagricultural male employed workers, 65 years or older, were engaged mainly at gainful work; the proportion for males 70 years or older was 85.2 percent. The remaining workers were attending schools, and/or doing housework in addition to working, or were leading the life of *kyugyosha*.[31] For females, the comparable figures were 43.9 percent for those 65 years or older and 41.7 percent for those 70 years or older.[32]

Flexibility in Work Organization

This section discusses some of the salient features of the Japanese industrial relations system: how management and labor in Japan com-

municate with each other; how they resolve differences and disputes; how effective these practices are; and how the Japanese practices compare with those in the United States. The purpose of the discussion is to examine how these features bear on the transaction-cost differences between the two countries.

One notable feature in Japan is said to be the flexibility in work organization and industrial relations. Flexible work organization is facilitated by the job-rotation system whereby typical workers are rotated among different tasks so that they may acquire a wide range of skills (Koike 1984; Aoki 1988, chap. 2). Aoki notes, for example, that

> [T]he multifunctionality of workers fostered by a wide range of job experience (and job rotation in particular) may enable each shop to adjust job assignments flexibly in response to the requirements of the downstream operation. . . . Further, workers trained in a wide range of skills can better understand why more defective products are being produced and how to cope with the situation as well as prevent it from recurring . . . (pp. 36–37).

To be sure, flexible job structures based on cross-training have existed in U.S. firms as well. For example, Jacoby (1989) views such practices prevailing in the late 1920s among some large firms as a key part of their attempts to stabilize employment. As Aoki (1988) notes, however, U.S. companies in the postwar years have tended to emphasize fine-task specialization and sharp job demarcation, and these are the characteristics that make it difficult to train workers to be multifunctional. In contrast, Japanese firms encourage workers' sharing of knowledge and tasks on the shop floor, thereby enabling them to cope with local emergencies effectively.[33]

Not to be overlooked, of course, is the likelihood that workers trained for a multitude of tasks are less resistant to an introduction of a labor saving technology. Unless the new technology reduces the demand for labor in all tasks, a worker is unlikely to suffer unemployment.

Industrial relations in Japan exhibit considerable flexibility along many dimensions, more so than in most other developed countries (e.g., Aoki 1989; Koshiro 1986; Morishima 1982, 132; OECD 1986, chap.

3). Aoki (1989) notes, for example, that "at the Japanese factory, emerging contingencies are often coped with on site by operating workers without authority and/or expert interventions, and the essence of workers' incentive package is to nurture their capabilities to do so . . ." (p. 7). He notes further (1988) that for this procedure to work smoothly,

> . . . operating jobs and emergent tasks (such as spotting, fixing, and preventing the recurrence of, problems) have to be integrated. However, strong property ownership over jobs, as observed under American "job control unionism," hinders such flexible and fluid job assignments" (Chap. 2).

It is noteworthy that the Japanese automobile transplants in the U.S. Midwest also insist on having flexibility over job assignments, production plans, etc., even at UAW-organized Diamond-Star Motors and Mazda Motor Manufacturing. (See chapter 5 for a related discussion.)

Another manifestation of flexibility is in Japanese collective agreements, which tend to be short, abstract, and often obscure (Hanami 1981, chap. 2). The brevity of contracts underscores their flexibility: there must be an implicit understanding among the parties involved that contract terms can be changed easily in response to newly emerging circumstances, thereby making detailed stipulations unnecessary. Contract flexibility in Japan is not limited to industrial relations. Rather it underlies most economic and other relationships, as Hanami points out:

> . . . Westerners consider it important to describe in as precise and detailed a manner as possible the standards which are to be applied in every possible disagreement. They feel that there is no way to settle conflicts without reference to a complete description of the rights and obligations of both parties. Japanese think it is both impossible and unnecessary to provide such an extensive written description and make provisions for every possible eventuality. They believe that no matter how detailed the clauses of a contract may be, some unanticipated developments are bound to occur, and that it is more important to establish mutual understanding and trust . . . Since economic deals in Japan are affected by emotional and sentimental factors, the parties to a contract always expect some flexibil-

> ity in implementation. The detailed enumeration of specific contract provisions would be fatal to this flexibility (p. 53).

Although the description above refers to contracts in general, its applicability to employment contracts seems obvious.[34]

Unionism, Labor Disputes, and Industrial Relations Practices

The aspect of industrial relations that is particularly indicative of low transaction costs is enterprise unionism and its function. Unions in Japan are often referred to as enterprise unions.[35] The enterprise union is by far the dominant form of union organization in Japan. In 1985, the latest year for which the relevant data are available, there were almost 12.5 million union members (about 23.4 percent of the total labor force), of which more than 91 percent were in enterprise unions.[36] Although most unions belong to national level federations, the basic issues of wages, working conditions, and like factors are negotiated at the company level.[37]

An enterprise union acts independently in bargaining with management. It differs from the locals of U.S. industrial unions in that it is not merely an administrative unit of a national union. Indeed, unlike the case in the United States, Japanese workers must become employees of a firm before they can join the union, and a typical union includes white-collar nonsupervisory employees as well as blue-collar workers.[38] An enterprise union is not a company union, but is a *bona fide* trade union. It engages in collective bargaining and has the legal right to strike and to engage in other job actions.[39]

Japanese unions also engage in collective bargaining, but unlike in the United States, a major collective bargaining takes place at a specific time of the year that is known to everyone, i.e., spring offensive or *shunto*. The spring offensive confers economies of scale in information gathering and transacting, so both sides can concentrate on collecting, exchanging, and verifying information at that time.[40] A noteworthy aspect of Japanese collective bargaining is that details are worked out at the

enterprise level rather than at the level of national union federations, as in the United States. Because of the simultaneous wage adjustments that take place annually, *shunto* has been viewed as being responsible for the prevalent wage flexibility in Japan (Gordon 1982; Hashimoto and Raisian 1987a,b; Taylor 1989).

An interpretation suggested by the theory outlined in chapter 2 is that the Japanese style of unionism is an institutionalized mechanism through which employer and employees invest in information reliability. Viewed this way, the enterprise union is an endogenous phenomenon, which became consolidated about the time that other Japanese labor market phenomena were becoming prevalent.

Employer and employee share common interests to a greater extent in an enterprise union system than in industrial or craft unions. As Taira (1970) put it, "The Japanese type of collective bargaining necessarily makes the union so conscious of the business conditions of the firm that the enterprise union is, for all practical purposes, just another management in the firm" (Taira 1970, p. 169). The enterprise union controls members' shirking and malfeasance as well as guards against employers' actions that are harmful to workers. The union has the incentive to monitor its members within an enterprise to uphold the reputation of its members as well as protect their interests from being deflected by the employer. These monitoring functions may be served more effectively by a union organized within firms rather than across firms. To promote mutual well-being, major decisions are made after close consultations between management and unions.

All this is not to say that labor and management seldom disagree in Japan, but disagreements seem to be less frequent in Japan than in the United States. As an indication, consider the extent of industrial disputes. The number of labor cases reaching public dispute settlement procedures, e.g., labor relations commissions or courts, is much smaller in Japan than in other industrialized countries (Hanami 1984). In 1976, for example, 0.407 cases per 1,000 labor force members were brought to the U.S. National Labor Relations Board for settlement, but in Japan the comparable figure was only 0.079 cases brought before either the Labor Relations Commission or the courts (Hanami 1984,

table 9).[41] Even the courts tend to rely heavily on compromise and conciliation rather than on issuing decisions.

Also, the two countries differ a great deal in the speed with which disputes are resolved. Typically, there are fewer cases of labor dispute—and the resulting productivity loss is smaller—in Japan than in the United States. Figures 3.7 and 3.8 indicate the extent of resource loss, as measured by the number of days lost, caused by labor disputes in each country. Noting the difference in the scale on the vertical axis between the two countries, one is easily struck by the much greater resource loss in the United States.

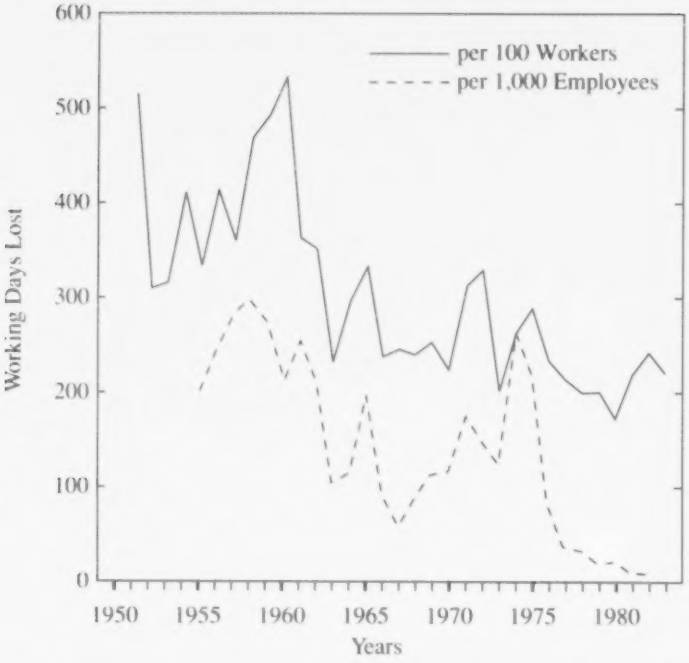
In 1981, for example, there were 955 labor disputes in Japan involving 247,000 workers. These disputes resulted in 554,000 working days lost, or 220 days per 100 affected employees, or 14 days lost per 1,000 employees economywide. In the United States there were 2,568 disputes involving 1,080,000 workers, resulting in 24,700,000 working days lost. The U.S. experience translates to 2,290 days lost per 100 affected employees or 276 days lost per 1,000 employees economywide, much higher figures than for Japan.[42]

Note that in figure 3.7 the number of days lost in Japan were rather high in the 1950s, with the declining trend setting in only after 1960. In contrast, figure 3.8 indicates an upward trend in the number of days lost in the United States. The Japanese pattern coincides remarkably with the spread of enterprise unionism starting in the late 1950s. Obviously, cooperative industrial relations in Japan are a rather recent phenomenon. This observation will be referred to shortly with the discussion regarding the interaction of the influences of culture and traditions with economic forces.

One of the reasons that Japanese strikes are so short-lived is that they often occur at an early stage in the bargaining process, whether or not negotiations are deadlocked. Thus, strikes or other acts of dispute simply demonstrate that the unions disagree with the management (Matsuda 1983, 193–195). Indeed, a distinguishing feature of the mentality of Japanese workers is said to be their reluctance to cause any serious damage to the firm in which they work (Shirai 1983, 135–140).

Finally, it should be noted that in Japan, as in the United States, the

Figure 3.7 Days Lost by Labor Disputes in Japan

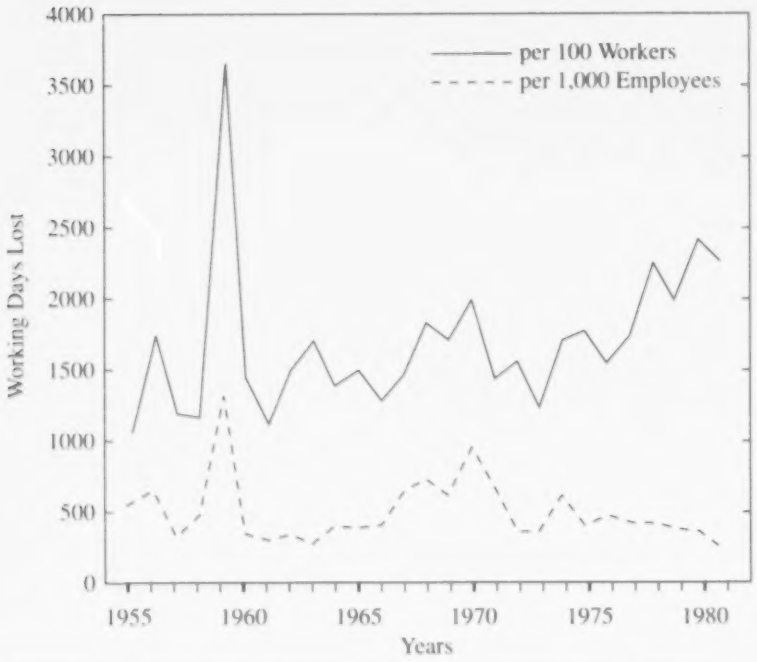


SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1983), table 147.

NOTES: The Japanese data exclude agricultural strikes, political strikes, and workers indirectly affected by a dispute in their own establishment, or by disputes lasting less than four hours.

rate of unionization has been on the decline. The proportion of union members in nonagricultural employment stood at 35 percent in 1970, but by 1985–86 it had fallen to 28 percent (Freeman 1989, exhibit 1). The reasons for the decline are not well-understood, though two explanations have dominated the literature. According to Freeman (1989), this decline is due partly to the fact that an increasing number of newly established firms do not have unions. Freeman hypothesizes that the Japanese decline, as the similar American decline, was caused largely by the increased management opposition to unionism.[43] The other

Figure 3.8 Days Lost by Labor Disputes in U.S.A.



SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1983), table 147.

NOTES: The U.S. data exclude disputes involving fewer than six workers or lasting less than a full day or shift. After 1981, the United States no longer collected data for disputes involving fewer than 1,000 workers, and as a result, U.S. data are not suitable for international comparisons.

explanation is offered by Neumann and Rissman (1984), who argue that, increasingly, government actions and policies have offered benefits which were traditionally the domain of the unions and that this trend has reduced the attractiveness of unionization. They present evidence indicating that state legislation, ensuring that discharges occur only for just cause, as well as increased social welfare expenditures have contributed to the decline of unionization. Whether this latter explanation is valid for the Japanese experience or not, or which of the two explanations is more relevant for Japan, is a subject for future study.

Dispute Settlement, Joint Consultations, and *Nemawashi*

As discussed above, the number of days lost due to labor disputes – an indicator of transaction costs – is low in Japan and started to trend down in the early 1960s, when enterprise unionism became prevalent. In the United States, however, not only are labor disputes numerous but the trend, if anything, has been upwards during much of the post-World War II period. Unions and management appear to work closely with one another in Japan. For example, they have a strong tendency to settle legal disputes through negotiation or *mutual understanding*. At the same time, grievances with no legal basis are handled by superiors in an informal way.[44] As noted above, the number of labor cases reaching the public office for dispute settlement is considerably smaller in Japan than in other industrialized countries. Even for cases reaching that stage, there is a heavy reliance on compromise and conciliation rather than on formal decisions. Compromise and conciliation obviously are more easily reached the lower the transaction costs.

Management and labor in many firms consult with each other throughout the year via the joint consultation system and, to a lesser extent, during grievance settlement procedures. Although grievance settlement procedures exist outside Japan, the joint consultation system is often thought to be unique to Japanese employment relations.[45] The meetings take place according to regularly set schedules for some firms, and as needs arise for others. It is noteworthy that this system exists even in nonunionized sectors, though it is more prevalent in the unionized sector.[46]

Table 3.3 reports the frequency of joint consultations and grievance settlement procedures, from a 1984 survey. The last row of column (2) indicates that of 1,802 unions, 1,068 (or 59 percent) had joint consultations. Among unions in large firms (1,000 or more employees), the proportion of unions using joint consultation was 71 percent. Even among very small firms (29 or fewer employees), the proportion was 34 percent.

Joint consultation is the primary channel through which the management and the union deal with problems unsuitable for bargaining –

Table 3.3 Number of Enterprise Unions with Joint Consultations and Grievance Settlement Procedures: Japan 1984

Firm Size (Employment)	Total	Joint Consultations				Grievance Procedures
		Exist		Do Not Exist		Exist
	(1)	(2) All	(3) Griev. Proc. Exist	(4) All	(5) Griev. Proc. Exist	(6)
1,000+	545	384	262	161	29	291
	(100)	(71)		(30)		(53)
		[100]	[68]	[100]	[18]	
100–999	689	434	257	255	29	286
	(100)	(63)		(37)		(41)
		[100]	[59]	[100]	[11]	
30–99	414	198	79	216	22	101
	(100)	(48)		(52)		(24)
		[100]	[40]	[100]	[10]	
29 or less	154	52	26	102	6	32
	(100)	(34)		(66)		(21)
		[100]	[50]	[100]	[6]	
All Groups	1,802	1,068	624	734	86	710
	(100)	(59)		(41)		(39)
		[100]	[58]	[100]	[12]	

SOURCE: Calculated from Japan Ministry of Labour, *Saishin Rodo Kyoyaku No Jitsujo* (The Latest Status of Labor Agreements) 1984, table 6-1.

NOTES: Magnitudes in ( ) and [ ] are percentages.

recruitment, dismissal, transfer and promotion, changes in production techniques and in management policies, plant closings, industrial safety, and the like (Shirai 1983; Hanami 1984; Sugeno and Koshiro 1987).[47] More important, however, is the *raison d'etre* of this system. In the survey underlying table 3.3, 86 percent of the unions listed expediting communication, and 83 percent listed promotion of harmonious relationships as the major objectives of joint consultations.[48]

Another notable phenomenon in Japan is consensus-based decision-making, whereby important decisions are made only after a consensus has been achieved through an extensive sharing of information and the practice known as *nemawashi*. As discussed in chapter 1 (note 3) this practice refers to the procedure of digging around the roots of a plant and trimming excessive roots in order to successfully transplant a tree later or to promote the bearing of abundant fruits. The term has come to mean taking every necessary step to realize an objective. This phenomenon is said to prevail throughout the economy and not just in the unionized sector. It would not be an exaggeration to state that joint consultation and consensus-based decisionmaking are two of the unique features of the Japanese industrial relations system.

Interestingly, the proportion of Japanese unions with formal grievance settlement procedures is lower than that for joint consultations, perhaps underscoring the preference of the Japanese to solve disputes informally. Thus, according to the last row of column (6) in table 3.3, 39 percent of unions, regardless of firm size, had such procedures. The proportion for large firms was 53 percent, and that for very small firms, 21 percent. These statistics are indicative of the minor role played by grievance procedures in Japanese industrial relations. In fact, this evidence can be viewed as indicating the effectiveness of joint consultations in reducing the number of disputes.[49]

In contrast, grievance procedures appear to be used widely in the United States. An overwhelming proportion of major U.S. labor agreements contain their own grievance and arbitration procedures designed to resolve disputes over contract interpretations (St. Antoine 1984, 253). It should be kept in mind, however, that in both countries, many grievances are resolved among the parties involved rather than by reliance on third parties.[50]

Grievances that are not resolved by the parties are referred to a third party, notably the Labor Relations Commission in Japan and arbitrators in the United States. American arbitrators are selected by the parties involved or are referred by the Federal Mediation and Conciliation Service (FMCS) or the American Arbitration Association (AAA). Decisions by the arbitrators are binding. In Japan, there are no counterparts

to FMCS or AAA for providing these services.[51] Instead, the Labor Relations Commission usually acts as the third party.[52] Even if a dispute ends up with the Commission, most cases—92 percent in 1981—are resolved through reconciliation.[53] In 1980, U.S. arbitrators referred by FMCS issued 7,539 decisions (Sloan and Whitney 1988, 246). It can be stated with confidence that at least an equal number of decisions were issued by arbitrators referred by AAA and by those selected by the parties involved.[54] The sheer magnitude of the U.S. settlements dwarfs the Japanese experience of fewer than 2,000 cases settled, both between the parties and with the help of third parties, in 1980.

The frequencies of grievance settlement procedures and joint consultations appear to be correlated in Japan. A comparison of columns (2) and (4) in table 3.3 makes it clear that the proportion of unions with grievance settlement procedures is decidedly larger for unions with, than for unions without, joint consultations. This evidence does not necessarily contradict the implication of the above argument that they are substitutes for each other. Rather, it may reflect the influence of a third factor—lower transaction costs—on both. In other words, these practices, together, reflect the phenomenon of low transaction costs in Japanese industrial relations.

Quality Control Circles

Another institution reflective of low transaction costs in Japan is the celebrated quality control (QC) circle. The Japanese quality circles were adopted from the concept of statistical quality control pioneered in the United States in the 1950s by W. Edwards Deming.[55] The practice spread widely after the Japanese Union of Scientists and Engineers began publication of the magazine *Genba to QC* (Quality Control for Foremen) in 1962, and by the early 1980s there were about a million circles there (Cole 1979, chap. 5; Blair and Ramsing 1983). Quality control circles in Japan are not limited to manufacturing: they exist among department stores, railways, retail shops, auto and television repair services, airlines, hotels, and even among municipal govern-

ments (Juran 1975). This practice has been imported to the United States since the mid-1970s with mixed results (see chapter 5 in this book).

The quality control circle is conceptually similar to joint consultation, but in practice there are important differences. In a QC circle only a handful of production workers doing related work directly participate. Rather than meeting in response to specific problems, a quality circle is a continuous-study process involving the issues of quality and productivity (Cole 1980, 26). In contrast, joint consultations involve both white- and blue-collar workers, not all of them doing related work, and deal with a much broader range of subjects than do quality circles.

Usually, there is more than one quality circle within a firm, and each deals with productivity issues specific to a particular stage of production. However, any worker not belonging to a circle can contribute to improved productivity by passing on his or her suggestions. Blair and Ramsing (1983, 492) note that "group cohesion and capacity for self-control is encouraged through team building exercises, limiting group size (3 to 10), and usually choosing homogeneous membership. The group derives status through the quality and value of its output." Rewards to participating in the quality circle are largely nonfinancial, being stated in terms of contribution to the company and self-development (Cole 1979, chap. 5). Such rewards, undoubtedly, are more effective where a longer-term employer-employee attachment exists.

It should be noted, however, that quality control circles in Japan have not always been successful. Many firms experienced problems with them for a few years after their introduction. In some firms workers felt that they were coerced into quality circles, and in others the emphasis on productivity made the participants doubt the value of the circles to themselves personally, with the result that their participation may have been a mere ritualistic behavior (Cole 1980). Moreover, whether or not quality control circles have had direct effects on productivity and quality remains an unanswered question: many firms already had the reputation for high quality by the time they adopted quality control circles (Hayes 1981).

How do these Japanese institutions fit into the theory developed in

chapter 2? I hypothesize that these institutions are the reflections of the investments that employers and employees make in the industrial relations system. These investments are encouraged by the underlying environment of low transaction cost – a low cost of investing in information reliability – in Japan. For example, the smooth functioning of joint consultation and consensus-based decisionmaking would seem impossible unless transactions between labor and management could take place at low cost. Viewed this way, it might be argued that transaction costs are high in the United States, as industrial relations there tend to be adversarial, and neither joint consultation nor consensus-based decisionmaking has been their central feature. Heavy reliance on formal grievance settlement procedures and on the well-developed institution of arbitration in the United States reflect the adversarial industrial relations there.

Cultural-Traditional Factors and Economics

Japan differs from the United States in many labor market characteristics. As will be seen in the next chapter, Japan has a greater prevalance of long-term employment and a more steeply sloped earnings-tenure profile. The country also has exhibited greater wage flexibility and less reliance on layoffs, greater use of bonus payments, and smaller resource loss from industrial disputes. These and other labor market contrasts underscore the unique characteristics of the Japanese wage and employment systems.

To what extent are the influences of culture and traditions responsible for the uniqueness of these labor market practices? This is an important but difficult question, which has consumed the energy of many scholars studying Japan.[56] For the purpose of the present analysis, one may search for clues to this question in the historical roots of the key institutions of Japanese industrial relations, and ask what evidence there is of continuity in the notable characteristics of the country's wage and employment systems. The literature on the history of the labor markets following the Meiji Restoration of 1868 is an obvious place to look.[57]

The history of the Japanese employment system points to the conclu-

sion that the forces of culture and tradition alone are not responsible for the prevalance of the unique features of the country's industrial relations system. Data on employment tenure and turnover indicate that long-term employment was much less prevalent in early years of modernization. For example, Gordon (1985, chap. 3) discusses various measures that firms in heavy industries adopted – bonuses to reward seniority, regular pay raises, etc. – to cope with the prevailing high labor turnover on the eve of World War I. According to Taira (1970, chap. 6, table 19), the proportion of employees in manufacturing with employment tenure of 10 years or more increased from around 3.7 percent in 1918 to 16.2 percent in 1924 and 23.8 percent in 1933, but dropped to 9.3 percent in 1939. These magnitudes contrast sharply with the almost 50-percent figure for 1980. Similarly, the rate of separation averaged 5.6 percent between 1916 and 1925, a shade below 4.3 percent between 1926 and 1933, and 3.9 percent during 1934–36. In contrast, as figure 3.4 indicates, the rate of separation during the post-World War II years was well below 3 percent. Finally, Saxonhouse (1976) reports that the average length of service of a female worker in the Japanese cotton-spinning industry was considerably shorter in the pre-World War II period (less than 44 months) than in the postwar period (63 months). He attributes the increased employment tenure in the postwar period to the spread of industrial training during that time.

The practice of *lifetime employment (shusin koyo)* began to appear, albeit sporadically, during the early years of industrialization, when a reduction of employment turnover, particularly of skilled workers, became the primary concern among employers. This practice became widespread during the high growth era of the late 1950s perhaps for the same reasons as in the prewar years.[58] The prevalance of this practice varied over the course of Japanese economic development, suggesting a rejection of the proposition that it was influenced primarily by culture and tradition.

Enterprise unionism is another Japanese phenomenon that is relatively new in history. In fact, trade unions were not recognized in law – though not outlawed either – until the Supreme Command for Allied Powers (SCAP) decreed their existence at the end of the Second World

War.[59] There were labor movements, and unions did exist, to be sure, before World War II, but they were neither strong nor extensive, according to Taira (1970, 163). In 1936, when trade-union membership reached its peak, for example, collective bargaining was nearly absent except for seamen and workers in marine transport industries (Taira 1970, 147).

Some enterprise unions that did emerge in the early 1920s were mostly among large firms in state-owned and private industries.[60] And membership grew steadily until the demise of unions in 1938, when they were forced to dissolve and to be organized into Sampo, a wartime patriotic labor organization dedicated to the promotion of workers' devotion to the war effort.[61] Unlike their postwar unions, however, prewar enterprise unions were confined to blue-collar workers (Shirai 1983, 124). In the early post-World War II years, unions began appearing at the factory level, but the tendency was for them to be formed separately for blue- and white-collar workers (Gordon 1985, chap. 9). During post-World War II years and throughout the 1950s, as noted earlier in figure 3.7, resource loss from industrial disputes was high, and only after the early 1960s did cooperative industrial relations emerge in Japan.

Similar histories can be told regarding the seniority wage *(nenko joretsu)* system and the practice of bonus payments. Both of these practices emerged after the process of industrialization was well on its way. In the early years of industrialization, seniority wages were limited to management level workers, while in modern Japan wages for even blue-collar workers follow the *nenko* pattern. Interestingly, bonuses, when they existed, had significant incentive elements in early years. For example, they were paid to individuals or groups of individuals who worked without absence for a whole month or other meritorious achievements.[62] In the modern Japanese corporate sector, bonus payments don't appear to be incentive payments, at least directly, as their magnitudes relative to the base pay do not appear to vary from individual to individual (Hashimoto 1979). Also, typical employment contracts do not specify the determinants of the magnitude of bonus payments, contrary to what one would expect if bonuses were incentive

payments.[63] It is clear that the nature of bonus payments is quite different in the modern Japanese economy from that of the early years of industrialization.

To summarize, prototypes of lifetime employment, seniority wages, and bonus payments were all developed in order to meet the need for stabilizing the employment of skilled workers as the process of industrialization accelerated and acute labor shortages, accompanied by high turnover, developed (Nakamura 1971, chap. 4; Taira 1970, chap. 5). Even as late as the interwar years, however, lifetime employment was far from being the reality in industrial relations. To be sure, large firms did develop a complex internal labor market during that period, with the prototype of the *nenko joretsu* system of wage payments (Shirai 1983, 124).[64] But the Japanese employment and wage systems, as we know them today, were not prevalent phenomena before World War II.[65] In fact, it was not until 10 to 15 years after the end of the Second World War that many of these features became widespread throughout the Japanese economy.[66]

The preceding discussions suggest that many of what appear to be uniquely Japanese features of industrial relations are, as Dore (1962) put it, "in fact fairly recent innovations, supported by traditional values to be sure, but consciously designed for good profit-maximizing reasons" (p. 120). Most of these features certainly don't appear to have been carried over from feudal Japan. One might insist on historical continuity and argue that the development after the late 1950s reflects a consolidation of the practices that had roots from the early years of industrialization (Gordon 1985, chap. 9). Even then, one is left with the question of what factors prompted the consolidation at that particular time. An answer to this question is suggested by the theme of this book: the rapid pace of economic growth interacted with cultural and traditional factors in shaping the labor market institutions in postwar Japan.[67]

Let me end this chapter by discussing the key assumption of the present theory: transaction costs have been lower in Japan than in the United States. It goes without saying that it would be useful to have direct evidence on the magnitude of transaction costs in both countries, but transaction costs are difficult, if not impossible, to measure directly,

and one would have to rely on circumstantial evidence. For example, a difference between Japan and the United States in a worker's typical response to a foreman's request that the rivet be placed from the left side rather than from the right is suggestive of the transaction-cost difference. Japanese workers are said to comply with such a request without argument, but American workers, who typically demonstrate strong individualism, tend to resist it out of a sheer stubbornness.[68] As discussed in chapter 2, however, it is not a fatal flaw of the theory that transaction costs are not directly observable.

Although the task of assembling such anecdotal evidence is left for a future study, it is worth pondering the important question of why transaction costs may be lower in one country than in the other. This question inevitably would involve the influences of culture and tradition. What kinds of traditional and cultural factors might one consider in light of the theory presented in chapter 2? Let me mention two phenomena in Japan, both related to agriculture, that may bear on this question.

Traditional agriculture appears to have influenced the shape of modern Japanese society along many dimensions. One is the sharing of decisionmaking. It seems reasonable to view such an approach as a low transaction-cost phenomenon. Aoki (1983, 25–26) traces the Japanese affinity for shared decisionmaking to the rice agriculture. Japanese terrain is mountainous, and rain water quickly flows away to the ocean unless steps are taken to conserve it. This situation led to the necessity for controlling and sharing irrigation water among rice farmers. As agriculture developed and the number of farmers sharing the water increased, it became necessary to devise "simple and egalitarian conventions" to economize on transaction costs. According to Aoki, these conventions became deep-rooted and were carried over to modern Japan.

The Japanese agricultural legacy also bears on the importance of family relationships based on the household, or the *ie*. One view holds that the resource base is essential to understanding the *ie* system in agriculture.[69] The *ie* system was the basis not only of agricultural activities but also of many commercial and manufacturing firms (Fruin 1983). In this system, even non-kin members were accepted as members

of this family. Even now, employment relationships in Japan share the characteristics of family relationships more than in the United States (Hanami 1981). Japanese workers, for example, tend to identify strongly with their employers, to the point that they expect their superiors to be involved even in their personal matters. It is telling that Takezawa and Whitehall (1981, 119) found that only 5 percent of Japanese, but 74 percent of American workers surveyed thought that their superiors should not be involved in their decisions about marriage. Their survey indicated, moreover, that 80 percent of Japanese, but only 15 percent of American respondents thought that their superiors should offer personal advice if requested. It seems reasonable that costs of communicating and transacting are lower in family-style relationships than in other types.

Undoubtedly one may identify more phenomena relating to the transaction-cost issue. Whatever they may be, I believe that an explanation based on the transaction-cost consideration opens a way of incorporating many of the influences of tradition and culture into a choice-theoretic framework of economic analysis.

NOTES

[1] Some of the material presented in this chapter, although developed in my previous research with John Raisian, has been updated. For further discussions on the Japanese macroeconomy, the reader may consult Nakamura (1981); Uchino (1983); and Minami (1986), all in English.

[2] These magnitudes were calculated from the data contained in Japan Productivity Center *Katsuyo Rodo Tokei* (Practical Labor Statistics) 1987, table I-7, and 1988, table I-6. Ellenberger (1982) claimed the American productivity advantage over Japan in the 1970s to be at 30 percent.

[3] Industries in which America enjoyed a productivity advantage are agriculture-forestry-fisheries, construction, food and kindred products, textile mill products, printing-publishing-and allied products, petroleum refining and coal products, fabricated metal, furniture and fixtures, rubber and miscellaneous plastic products, stone-clay-glass products, motor vehicles and equipment, transportation equipment, apparel and other fabricated textiles, service, finance-insurance-real estate, and electric utility and gas supply. Industries in which Japan had the productivity advantage are mining, lumber and wood products, paper and allied products, chemical and allied products, leather and leather products, primary metal products, electric machinery, precision instruments, miscellaneous manufacturing, and transportation and communication. The two countries are tied in machinery and wholesale and retail trade. See Jorgenson and Kuroda (1990, table 5).

[4] Curiously, Drucker's claim appears to be in conflict with the finding by Jorgenson and Kuroda

(1990) that the U.S. motor vehicle industry enjoyed a productivity advantage over its counterpart in Japan in 1985 and that the gap is likely to grow in the future.

[5] According to these authors, in automobile manufacturing, Japanese workers in stamping and assembly plants are twice as productive as U.S. workers; in engine and transmission manufacture, they are 50 percent more productive; and in iron foundries, 20 percent more productive. They note, however, that higher labor productivity in complex manufacturing has been achieved only since the late 1970s by Japanese firms (Abegglen and Stalk 1985, 61–62).

[6] The coefficient of variation (the standard deviation as percent of the mean) is 0.81 for the United States and 0.64 for Japan for the entire 1950–88 period. This finding does not agree with our earlier finding that productivity is more cyclically variable in Japan than in the United States (Hashimoto and Raisian 1987a). The present finding, which includes the data for most of the 1980s, suggests an opposite conclusion.

[7] By the period 1985–88, the Japanese growth rate in manufacturing output fell to about 3.3 percent per year, somewhat lower than the U.S. growth rate of 3.9 percent. However, if we extend the period back by one year, i.e., 1984–88, the Japanese growth rate turns out to be 5.4 percent, and the U.S. growth rate, 5.1 percent. These are the geometric averages of output growth rates calculated from the data in the U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 146.

[8] Jorgenson et al. (1987) also found that differences in the growth rates of labor input were not pronounced between the two countries during the post-World War II years.

[9] See Hashimoto 1990a for details.

[10] For further discussions on Japanese and American unemployment rates, see Moy and Sorrentino (1981); Taira (1983b); Tominomori (1985); Sorrentino (1976, 1981, 1984); Ito (1984); and Hamada and Kurosaka (1984, 1986).

[11] The U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, Bulletin 2217 (June 1985), table 126, published both reported and modified Japanese unemployment rates. The last year for which the data are reported is 1983. The next and most recent edition of the *Handbook*, Bulletin 2340 (August 1989), table 143 only reports modified unemployment rates. Reported unemployment rates for Japan continue to be available in Japanese publications, however.

[12] This adjustment raised Japanese unemployment rates by, at most, one-tenth of a percentage point in the early 1980s.

[13] The Bureau of Labor Statistics (BLS) adjustment procedure evidently had little impact on the Japanese unemployment series. During the 30-year span between 1959 and 1988, the modified and the official series differed from each other during only 10 of these years. Curiously, all of these differences amounted to one-tenth of one percentage point.

[14] The major grounds for dismissal are misrepresentation by employees of educational background or previous employment experiences, markedly poor records of performance, outright insubordination, serious misconduct relating to duties, and criminal conduct in private life (Sugeno and Koshiro 1987, 135).

[15] Sugeno and Koshiro (1987, 135) report that in 1983 there were 1,270 suits filed by workers involving employment relations. Almost half of them were initiated to challenge employment termination.

[16] For the economy as a whole and for manufacturing, the ratio of quits to dismissals (or layoffs) is typically more than twice as large in Japan as in the United States. Total separations, quits plus dismissals (or layoffs), tend to be unrelated to economic conditions in both Japan and the United States. The reason for this phenomenon is different in the two countries, however. In Japan neither

quits nor dismissals are related to economic conditions. In the United States, quits rise, but layoffs fall, during upswings, and as a result total separations exhibit unclear movements (Hashimoto 1990b). As is well-known, the distinction between quits and dismissals (or layoffs) may not be clearcut. Still, the contrast between the two countries is revealing.

[17] See Hashimoto (1990c) for details. See also Moy and Sorrentino (1981) and Hamada and Kurosaka (1986) for informative discussions on this issue. Comparing unemployment rates between Japan and the United States entails all sorts of difficulties. For example, according to Taira (1983b), Japanese unemployment rates would rise by 80 percent if they were made consistent with U.S. definitions. He reaches this conclusion by using specially tabulated series, which are available only for the late 1970s. Sorrentino (1984) disagrees with Taira and argues that he should not count as unemployed persons who are without jobs and waiting to report to new jobs within 30 days. In the United States such persons are counted as unemployed only if they are available to begin work immediately. To the extent Taira could not distinguish those who could begin work at once, he might have overestimated the unemployed pool in Japan. See Hashimoto (1990c) for a discussion on *kyugyosha* and the calculation showing that the Japanese-American unemployment rate difference would not narrow substantially even if all of the *kyugyosha* workers were to be counted as unemployed persons.

[18] This phenomenon may be due in part to the Japanese unemployment insurance law. There, unemployment compensation is available to workers on short-time schedules, but in the United States such workers are not eligible for compensation (Sorrentino 1976, 22). Thus, there should be a greater incentive in Japan to use short-time rather than layoffs during downturns.

[19] It should be noted, however, that some U.S. labor contracts restrict the use of layoffs to meet a decline in labor demand. For example, a U.S. Steel Corporation agreement in the early 1970s specified that layoffs would not be used until hours of work fell below 32 per week. The United Auto Workers had a similar provision stating that layoffs could be used only after hours of work were maintained at less than 32 per week for four weeks or more (Koike 1977, 81 and 100; Akiyama et al. 1984).

[20] According to Ito (1984), the low teenage unemployment in Japan accounts for 20 to 25 percent of the Japanese-American difference in unemployment rates.

[21] The 1986 Equal Employment Opportunity Law prohibits sex discrimination in vocational training, fringe benefits, retirement, and dismissal. For an informative discussion on this law, see Edwards (1988).

[22] Mandatory retirement has been eliminated by the age discrimination law in the United States.

[23] The remaining life expectancy at age 20 for a Japanese male was 48.47 (52.25 for females) in 1955 in contrast to 50.1 (55.8 for females) for white persons in the United States. In 1987, a Japanese male who had lived to age 20 could expect to live an additional 55.74 years (61.20 years for females), and a comparable U.S. white male could expect to live an additional 53.3 years (59.8 years for females).

[24] Carmichael's (1983a) model potentially addresses this issue, but the effect of a greater amount of firm-specific human capital on the retirement age is not clear in his model. As will be discussed shortly, the rising retirement age in Japan may also reflect the rapid aging of the population.

[25] Presumably, it is more costly for larger firms to differentiate the wage scheme between those who were hired early and those who were hired late in life. Mandatory retirement may be the least costly method of preventing those late arrivals from extracting the rents.

[26] This point was suggested by Jacob Mincer in a private conversation.

[27] As evidence of the demographic pressure, note the repeated attempts by the Japanese government to alleviate the budgetary burden by raising the eligibility age for the social security program from 60 to 65. As of summer 1990, the opposition has succeeded in blocking the implementation of this change. I thank Machiko Osawa for providing me with information on the current debate on this issue in the government.

[28] The U.S. magnitudes were calculated from the data in U.S. Bureau of the Census, *Statistical Abstract of the United States*, 1990, table 13, and the Japanese magnitudes from Japan Statistics Bureau, Management and Coordination Agency, *Japan Statistical Yearbook*, 1989, table 2-9.

[29] Koike (1987, 84–92) reports that large Japanese firms have tended to resort to the redundancy measure after two years of continuous losses.

[30] Note that an implicit assumption in Carmichael's argument is that there is a prospect of recovery in the future. Without such a prospect, it may not make sense to continue training a worker.

[31] These magnitudes are only slightly less than the 98.7 percent figure for male nonagricultural employees, 40–54 years old. These data are from Japan Statistics Bureau, Management and Coordination Agency, *Annual Report on the Labour Force Survey* (1988, table 14).

[32] The comparable magnitude for females 40–54 years old is 58.9 percent.

[33] See chapter 4 for an additional discussion on Japanese training practices.

[34] Thus, Hanami (1981) goes on to say, "The reluctance to have one's rights and obligations clearly defined is to be found not only in the individual relationship between an employee and his employer but also in the relationship between unions and employers. The situation in industrial relations does not differ markedly from the description of personal or business contracts. . . ." (p. 53). For a comprehensive treatment on Japanese labor relations, see also Sugeno and Koshiro (1987).

[35] Industrial or craft unions are rare in Japan. The only significant craft union is the Zen Nihon Kaiin Kumiai (All Japan Seaman's Union).

[36] The remaining members were divided primarily between craft unions (1.3 percent) and industrial unions (5.5 percent). As is true for the United States, unionism is more prevalent in larger Japanese firms. In 1989, for example, over 52 percent of union members worked in firms with 1,000 or more employees and only about 5 percent were in firms with 100 or fewer employees. These magnitudes were calculated from the data contained in Japan Productivity Center, *Katsuyo Rodo Tokei* (Practical Labor Statistics) 1990, 168–169.

[37] Japanese enterprise unions resemble works councils *(Betriebsräte)* in West Germany. For example, both use joint consultation along with collective bargaining. There are important differences between the two, however. For example, *Betriebsräte* is required by law and is financed by employers. Japanese unions are not required by law, but are voluntary associations of workers, and are not financed by employers. *Betriebsräte* cannot strike and engage in other job actions as Japanese unions do. For more details, see Shirai (1983) and Koshiro (1983a,b), which contain excellent discussions of Japanese enterprise unions.

[38] Enterprise unionism began to appear during the interwar years among large firms. Pre-World War II unions consisted largely of blue-collar employees. Also, unlike the case in Japanese enterprise unions, a foreman in a U.S. factory is not a member of the local (Koike 1977, 38–40).

[39] Enterprise unions belong to industrial federations, which in turn belong to national confederations. The main functions of federations and confederations are collection and dissemination of information and involvement in political activities. Until November 20, 1987, there were three major confederations: the left-oriented Sohyo (General Council of Labor Unions), founded in

1955, with close to 4.1 million members in 1987; the right-oriented Domei (Japanese Confederation of Labor), founded in 1964, with over 2.1 million members in 1987; and Churitsuroren (Independent Confederation of Unions), founded in 1956, with over 1.6 million members in 1987.

Both Domei and Churitsuroren were disbanded on November 20, 1987, when Rengo (Japanese Private Sector Trade Union Confederation), with almost 5.6 million members, was inaugurated. Sohyo, too, merged with Rengo in late 1989. Rengo now includes both private- and public-sector employees. These data were gathered from Hanami (1981); *The Japan Times*, 5 December 1987, Weekly Overseas Edition, and Japan Productivity Center, *Katsuyo Rodo Tokei* (Practical Labor Statistics) 1988, 161.

[40] The spring offensive was first launched in 1956 by Sohyo (General Council of Labor Unions) in order to develop a common labor front on wage bargaining. Spring was chosen presumably because that is the time when new employees are hired and wage increases implemented, and when the new fiscal year begins on April 1. See Seike (1986) for an interesting analysis of the effects of the 1986 *shunto* on wage increases.

[41] In West Germany, the comparable figure is over 15 cases brought before the labor courts. Japan does not have a German-style system of labor courts.

[42] The same general conclusion obviously holds for other years as well, as indicated in figures 3.7 and 3.8. After 1981, the U.S. data on labor disputes refer only to membership larger than 1,000 workers and are not comparable to the Japanese data. One word of caution is in order when interpreting the Japanese data: the information on disputes used here does not include more subtle forms of work stoppages, such as "go-slow" or "work-to-rule" methods. These informal practices are believed to be more widely used in Japan than in the United States. Indeed, these practices are unpopular in the United States. (See, for example, Hanami and Blanpain 1984, part IV by Hanami and part V by St. Antoine.)

[43] A piece of anecdotal evidence for his hypothesis was offered by a Japanese president of a mid-sized firm (about 800 employees), who told me that he started a friendship club in his firm to promote the exchange of information between management and labor, hoping to forestall unionization of his workforce. See also Machiko Osawa (1988a) for an interesting discussion on the recently emerging issues of Japanese industrial relations.

[44] It is interesting to note that union and management representatives at Chevrolet and Fleetwood once emphasized that one of the best signs of a healthy employment relationship is the willingness to resolve disputes through informal oral discussions rather than by resorting to official written grievances. (See St. Antoine 1984, 312–313.)

[45] As pointed out in chapter 1, works councils (*Betriebsräte*) in West Germany also use joint consultations.

[46] According to a survey taken by the Ministry of Labor in 1977, almost 83 percent of unionized establishments and slightly over 40 percent of nonunionized establishments had joint consultations (Shirai 1983, 143). For informative discussions of joint consultations, see also Koshiro (1983a) and Sugeno and Koshiro (1987).

[47] According to Sugeno and Koshiro (1987), joint consultation provides the parties with "channels for intimate communication with the result that many matters which might otherwise develop into shop floor disputes are agreed upon in advance and peacefully implemented" (p. 143).

[48] Other objectives mentioned are the maintenance and improvement of working conditions (77 percent), improvement in productivity (63 percent), participation in management activities (38 percent), and other (20 percent). This information is from Japan Ministry of Labour, *Saishin Rodo Kyoyaku No Jitsujo* (The Latest Status of Labor Agreements) 1984, table 5-3. A case study may be an effective way of appreciating the workings of joint consultations and grievance procedures. An

interested reader is referred to an illuminating case study of the Japan Steel Corporation and the Postal Service by Sugeno and Koshiro (1987).

[49] Sugeno and Koshiro (1987, 137–140) present additional evidence that in Japan grievance procedures are much less prevalent than joint consultations. In fact, they state that joint consultations reduce the number of grievances.

[50] This point is easily established for Japan from published sources. In 1981, for example, over 87 percent of the disputes that were actually settled were between the parties involved (Hanami 1984, table 1). Comparable data for the United States could not be found. The author's conversation with an experienced arbitrator suggests that the U.S. proportion may also be high.

[51] This absence presumably reflects Japanese aversion to reliance on outsiders to make decisions affecting their well-being. In contrast, the United States has experienced an increased use of arbitration in the settlement of labor disputes (St. Antoine 1984, 267).

[52] In 1981, of 261 settlements handled by third parties, 249 were decided by the Labor Relations Commission (Hanami 1984, table 1).

[53] Japan may not be unique in having mediation and conciliation as the major channels of dispute settlement. Although comparable data could not be found for the United States, St. Antoine states that mediation and conciliation are the first steps to conflict resolution by the arbitrator (St. Antoine 1984, 262).

[54] This information was received during a private conversation with an experienced arbitrator in the United States.

[55] See Cole (1979, 1980), and Blair and Ramsing (1983) for additional details on the history and practices of quality circles in Japan. In chapter 5, I briefly discuss quality circles in the United States.

[56] See, for example, Dore (1962) and, more recently, Hamilton and Biggart (1988).

[57] After 1639, Japan pursued a policy of isolationism, shunning foreign contacts except with Holland, which, on the grounds that it was Protestant rather than Catholic, was permitted to engage in trade under strict control on the island of Deshima in Nagasaki. Isolationism ended 220 years later in 1859, when the feudal Tokugawa government opened the ports of Kanagawa, Nagasaki, and Hakodate to Russia, Great Britain, France, Holland, and the United States (Morishima 1982, 57–59). With the Meiji Restoration of 1868, Japan formally abandoned the feudal system and returned to the imperial system. The Meiji Restoration is a momentous juncture in Japanese history because "it laid the foundation for the building of a modern state on the Western model" (Morishima 1982, chap. 2). Japan experienced a period of severe inflation after the Satsuma Rebellion (1877), which resulted in the so-called Matsukata deflation (1881–84), establishing a new monetary system. The gold standard was adopted in 1897. It was during the period from 1886 to 1900 that modern industries became firmly established in Japan. For further detail, see Minami (1986); Morishima (1982); Nakamura (1971, 1981); Nishikawa (1980); and Taira (1970), all in English.

[58] An established opinion among Japanese scholars is that Japan entered the period of "excess demand for labor" in the beginning of the 1960s (Nakamura 1981, 158). Interestingly, this time period more or less coincides with the period in which long-term employment became increasingly prevalant (Hashimoto and Raisian 1985).

[59] The government often suppressed labor movements using the Public Peace Police Law (1900) as a legal basis. In 1926, this law was modified to weaken the government's power against the labor movement, but a new law, the Peace Maintenance Law, instituted at the same time, was designed to suppress communistic movements. The government used this law to continue suppressing unionism. Garon (1987) contains informative discussions of the history of Japan's social policy and labor movement.

[60] State-owned industries with enterprise unions included arsenals, naval shipyards, the tobacco monopoly, and municipal street railways. Private industries included mining, steel, machinery, engineering, shipbuilding, copper refining, textile, and electricity and gas supply (Shirai 1983, 124). See Gordon (1985) for an illuminating discussion on union movements in Japanese heavy industries during early years of modernization.

[61] According to Shirai (1983, 124), membership in enterprise unions grew during the 1920s to reach the point where, by early 1930s, nearly half of all union members were in enterprise unions.

[62] "The bonus sometimes took the form of exemption from boarding charges for workers" or "a remittance of additional cash directly to the homes of the workers in the hope that parents might become instrumental in encouraging their children to cultivate regular work habits" (Taira 1970, 120–21). Gordon (1985, 101) states that in the early 1920s bonuses were "part of the continuing effort to control work more directly, tighten discipline, and encourage efficiency. Only men considered models of conduct were eligible and in many cases a good rate of attendance was a prerequisite."

[63] The magnitude of bonus payments is a subject of annual collective bargaining, *shunto*.

[64] In the early 1930s, large firms began using increasing numbers of temporary workers. Gordon (1985) attributes the use of temporary workers during these years to "the chaos of high labor turnover and pirating of skilled workers that accompanied the World War I boom as well as the subsequently bloated payrolls of the 1920s bust," all of which increased the tendency to designate many of the new employees "temporary," who received a yearly contract renewable at company discretion (pp. 135–36). Taira's description resembles that often given for temporary workers in the postwar period. For example, he states that the temporary worker was "identical to the regular workers in all aspects of work on the shop floor, but he was considered a miscellaneous worker employed for a short fixed term, sometimes on a day-to-day basis, at rates of pay markedly inferior to those of the regular worker. Not only were 'temporary workers' deprived of fringe benefits within the firm, but they were not counted as factory 'operatives' protected by the Factory Law and related measures" (Taira 1970, 161–63).

[65] See Taira (1970, 164). It appears also that it took a while for the *nenko joretsu* system of wage setting to take hold after World War II. Nakamura (1981, 166) observes that large firms showed a trend toward an increasingly steeper slope in their seniority wage curves during the late 1950s. A chapter by Ono in Nishikawa (1980) contains a related discussion of postwar changes in the Japanese wage system.

[66] Recall also that the separation rates were rather high until the late 1950s, when the declining trend set in (figure 3.4). It is worth noting also that the famous *kanban* (just-in-time) system, pioneered by the Toyota Motor Company, began to be used in many manufacturing plants only in the late 1970s. Under this system, materials, parts, and components are produced and delivered just when they are needed. For an informative discussion of the *kanban* system, see Abegglen and Stalk (1985).

[67] This argument doesn't deny the role played by the reforms in legal and political framework introduced by the Occupation; rather, it focuses on the economic forces that made these reforms take effect.

[68] This episode was conveyed to me during a private conversation with a Japanese manager, who operates factories in both Japan and the United States. Fucini and Fucini's (1990) observation that "American workers balk at remaining at the office after five to wait for an important phone call, or refuse to come to the plant on weekends to work on a rush project . . ." (p. 131) is also indicative of high transaction-cost that must be incurred in coping with fluctuations in production plans.

[69] In fact, the *ie* system has been a point of controversy among anthropologists and others interested in Japanese society. An ongoing debate exists on the existence and importance of the economic basis in the *ie* system. According to Moore (1985), upstream areas in a northern Japanese village, having greater resources than downstream areas, had a higher rate of household formation during the 108-year period. He also discusses the controversy surrounding the *ie* system.

4

Evidence Bearing on the Theory's Implications

This chapter begins with a test of the proposition that transaction costs are lower in Japan than in the United States. It will then look at some of the observed phenomena related to the implications of the theory discussed in chapter 2: the importance of bonus payments in Japan; the structure of compensation; and the differences between Japan and the United States in on-the-job human capital investments, and in the adjustments of employment, hours of work, and inventories to fluctuations in product demand.

Is there evidence that transaction costs in fact are lower in Japan than in the United States? As discussed in chapter 2, this is not an easy question to answer, as transaction costs are not directly measurable. However, even with the paucity of data, it is possible to shed light on this issue by posing the question, if transaction costs in the labor market were lower in Japan than in the United States, what kinds of phenomena would one expect to observe? This question is addressed here by focusing on how the quit-dismissal distinction may be related to economic conditions in the two countries.

Distinction Between Quits and Dismissals

Our theory suggests that the lower the transaction costs between employer and employees, the less clear the distinction between quits and dismissals will be. Indeed, if transaction costs were zero, such a distinction would be meaningless, as both employee and employer would make exactly the same, and efficient, separation decisions. In this case, it would be inconsequential whether a separation is labeled as a dismissal

because the employer initiated it, or as a quit because the employee was the initiator. If transaction costs were positive, the employer's separation decision would be different from the employee's, and neither decision would be efficient. (See Hashimoto and Yu 1980 for an elaboration.) As a result, the efficiency implication of a separation would depend on who initiates the separation, and the quit-dismissal distinction would be clear. The higher the transaction costs, the lower the frequency of efficient separations relative to inefficient separations will be, and therefore the higher the likelihood that the quit-dismissal distinction is meaningful. Our theory posits transaction costs to be higher, and therefore the quit-layoff distinction to be more pronounced, in the United States than in Japan.

Whether or not the quit-layoff distinction is meaningful has been investigated recently by three labor economists in the United States (McLaughlin 1987; Peters 1986; Antel 1985). McLaughlin began by asserting that the distinction doesn't matter, and claimed to have found evidence for his assertion for the U.S. labor market. However, the version of his paper made available to me did not spell out what one would expect to find if the distinction mattered. As a result, his study does not seem to be a direct test of how meaningful the distinction is.

Peters used a similar argument as the one underlying my previous model (Hashimoto 1981) and examined transaction costs in the U.S. divorce market. She concluded that divorce tends to occur when it is efficient, i.e., transaction costs in the divorce market are low. Finally, Antel developed a test of my earlier model (Hashimoto 1981), which he applied to the U.S. National Longitudinal Survey. His findings indicate that the quit-layoff distinction is meaningful in the U.S. labor market, thereby confirming that transaction costs are positive there. The reader is left to evaluate the relative merits of these studies; to my knowledge, there have been no studies on this issue using Japanese data.

It would be interesting to replicate Antel's test using microdata for Japan, but unfortunately such data are unavailable. Instead, one must rely on aggregate data to investigate this issue. The hypothesis examined here is that the quit-dismissal distinction in Japan is less closely related to economic conditions than it is in the United States. One would

expect that in Japan, where transaction costs are hypothesized to be low, it would be unclear as to which party initiated separation in a large number of the cases. As a result, the reported distinction in Japan would tend to be arbitrary and independent of economic conditions. In the United States, where transaction costs are hypothesized to be high, the employer and employee would make their own separation decisions in response to exogenous changes in labor demand, and their decisions would be reported either as layoffs or quits, depending on which party made them. One would expect, therefore, that the reported distinction between these separation categories would tend to be more random and less related to economic conditions in Japan than in the United States.

Before proceeding with the testing, a brief discussion is in order on the data sources. For the United States, two data sources reported in the *Handbook of Labor Statistics*, published by the U.S. Bureau of Labor Statistics, are used. One classifies the stock of unemployed persons by whether they are job-leavers or job-losers. The other source, though discontinued as of 1981, reports the flow of monthly labor turnover in manufacturing, broken down by quits and layoffs for previous years. For those years, I use the annual averages of the monthly series.

The Japanese situation is a little more complicated. One must first face the question of how to distinguish between quits and dismissals (or layoffs), as the Japanese data do not directly distinguish between the two categories. I use the data from two surveys, both reported in *Yearbook of Labour Statistics* (Japan Policy Planning and Research Department, Ministry of Labour, Sections B and C in various years). The *Maigetsu Kinro Tokei Chosa* (Monthly Labor Survey) reports monthly labor turnover rates for some nine industries, but it does not break them down into quits and dismissals. The only published data source that can be used for our purpose is the *Koyo Rodo Tokei* (Survey on Employment Statistics), which reports on the annual number of separated persons grouped by reason for separation. Although this survey does not explicitly classify separations as quits or dismissals, the stated reasons for separations facilitate such classification.

In particular, I define quits to be those whose separations are due to employees' misdeeds, employees' conveniences, or marriage and con-

finement, and dismissals to be separations due to termination of contract or to employer's convenience.[1] The reader is cautioned that these data pertain only to regular employees, not to temporary employees or day laborers. As a result, our findings cannot be generalized to the labor turnover situation for the whole Japanese economy. However, since our theory is concerned with the turnover situation for regular, or similar, workers who invest in employment relations, our findings do offer valid evidence.[2]

To test if the quit-dismissal distinction is meaningful in the two countries, I estimated the following regression for the quit and dismissal rates, and for the ratio of quit and dismissal rates:

$$Y_t = a_0 + a_1 \text{LGNP} + a_2 \text{Time}, \tag{1}$$

where Y_t is quit or dismissal rate or the quit-dismissal ratio, *LGNP* is the deviation of the logarithm of the real gross national product from its trend, and *Time* is the time trend variable.[3] The regression estimates are reported in table 4.1.

The regression coefficient of immediate interest is a_1. Our hypothesis predicts it to be less statistically significant in Japan than in the United States. As is clear in table 4.1, the estimates of a_1 are insignificant in all of the Japanese regressions, but are significant with predicted signs in all of the U.S. regressions except for the quit regression for all industry.[4]

An eye-opener is the result for manufacturing, where the number of observations are identical for both countries. All of the estimates of a_1 for the United States are statistically significant at conventional levels, but none of the Japanese estimates are. The U.S. findings of statistically significant a_1 coefficients – positive in the regressions for quit rates and the quit-layoff ratio and negative in the layoff regression – reaffirm what is known already; namely, in the United States quit rates rise, and layoff rates fall, when economic conditions improve, and vice versa when they deteriorate. As a result, the ratio of quits to layoffs rises during upturns. No such pattern emerges in the Japanese regressions. The evidence presented in table 4.1 offers support of the proposition that transaction costs are lower in Japan, at least for regular workers, than in the United States, and that the U.S. labor market is characterized by what Hall and Lazear (1984) called an "excess sensitivity of layoffs and quits to demand" (pp. 233–257).

Table 4.1 Quit-Dismissal Distinction in Japan and the United States

	Intercept		LGNP		Time		$\bar{R}^2$
	(t-values in parentheses)						
Japan							
All Industry (1955–85)							
(1) Quit	5.076	(4.1)	0.707	(0.5)	0.127	(1.9)	0.83
(2) Dismissal	1.082	(12.6)	0.244	(0.9)	0.004	(0.9)	0.09
(3) RATIO:							
(1)/(2)	5.168	(3.9)	−1.770	(−0.8)	0.080	(1.1)	0.53
Manufacturing (1955–85)							
(1) Quit	11.138	(7.0)	−1.379	(−0.8)	−0.039	(−0.5)	0.76
(2) Dismissal	2.597	(9.6)	0.612	(0.8)	−0.020	(−1.3)	0.16
(3) RATIO:							
(1)/(2)	5.145	(4.1)	−2.597	(−1.3)	−0.007	(−0.1)	0.45
United States							
All Industry (1967–83)							
(1) Quit	455.766	(6.6)	−23.311	(−0.1)	28.178	(4.5)	0.93
(2) Layoff	478.483	(1.4)	−28.597	(−4.1)	281.759	(8.3)	0.91
(3) RATIO:							
(1)/(2)	0.399	(15.9)	2.299	(4.1)	−0.012	(−5.1)	0.79
Manufacturing (1951–81)							
(1) Quit	2.191	(7.8)	13.035	(5.0)	−0.015	(−1.0)	0.69
(2) Layoff	1.892	(17.0)	−14.864	(−11.1)	−0.018	(−3.1)	0.88
(3) RATIO:							
(1)/(2)	1.243	(4.8)	20.113	(6.1)	−0.008	(−0.5)	0.70

SOURCES: Japan Ministry of Labour, *Yearbook of Labour Statistics*; Japan Productivity Center, *Katsuyo Rodo Tokei* (Practical Labor Statistics) 1988, 1989, 1990; U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics*, 1985.

NOTES: LGNP is the deviation of the logarithm of the real GNP from its trend. These regressions adjust for a first degree autoregression in the residuals. See text for discussions on the definitions of quits and layoffs.

Bonus Payments and the Compensation Structure

There is little doubt that the most distinguishing characteristic of the Japanese compensation system is the importance of the bonus in earnings. Bonus payments are ubiquitous in Japan, being commonly made to both blue-collar and white-collar workers (Hashimoto 1979; Hashimoto and Raisian 1987a,b; Freeman and Weitzman 1987). Bonuses are

Table 4.2 Percent of Annual Total Cash Earnings Paid in Bonuses: Japan (1951–1987)

	Workers in All Industries Size of Employment			Workers in Manufacturing Industries Size of Employment		
	5+	5–29	30+	5+	5–29	30+
	%	%	%	%	%	%
1951	na	na	13.6	na	na	12.5
1955	na	na	14.4	na	na	12.6
1959	16.5	11.0	18.0	15.8	7.3	17.5
1963	19.9	14.4	21.3	19.0	11.4	20.6
1967	20.9	15.3	22.4	20.1	12.7	21.5
1971	23.1	17.4	24.8	22.9	15.2	24.5
1979	23.8	18.4	26.1	23.1	15.8	25.0
1981	23.9	17.7	26.4	23.5	15.2	25.5
1983	23.1	17.0	25.5	22.8	14.2	24.8
1985	23.1	17.4	25.4	22.6	14.0	24.7
1987	23.0	17.8	25.2	22.1	13.5	24.2

SOURCES: Calculated from the *Maigetsu Kinro Toket Chosa* (Monthly Labour Survey) as reported in Japan Policy Planning and Research Department, Ministry of Labour, the *Yearbook of Labour Statistics*, 1988.

NOTES: Bonus payments are based on the official data on special payments of which the bulk is bonus payments.

usually paid twice a year, once in July – a gift-giving season coinciding with *obon* (the occasion when the spirits of the deceased are celebrated) – and in December – a time to prepare for the new year.

In previous work, I hypothesized that the Japanese bonus payment represents the worker's share in the returns to the investment in firm-specific human capital, and presented the analysis of that hypothesis (Hashimoto 1979). Based on this argument, the greater bonus proportions in Japan, as compared to those in the United States, can be viewed as reflecting the greater importance of firm-specific human capital in Japan. More recently, Freeman and Weitzman (1987) argued that the bonus is, at least in part, a profit-sharing payment to workers. Whether bonus payments reflect workers' shares in their firm-specific human capital (Hashimoto 1979) or an aspect of a shared economy (Weitzman 1984), there is no question that an average Japanese worker counts on

bonus payments as a dependable source of income year after year. During the bonus seasons, the public media are full of advertisements by banks and retailers attempting to attract bonus money. Table 4.2 indicates that the bonus payment makes up a sizable share of the annual earnings of Japanese workers, that its relative importance is greater for workers in larger firms, and that its share tended to increase after 1951 to at least the early 1980s.[5]

The high proportion of bonus payments in worker compensation appears to be unique to Japan.[6] Table 4.3 summarizes compensation categories for production workers in manufacturing industries in Japan and the United States. The proportions of total compensation for direct, indirect, and legally required insurance differed little between the two countries. For example, in 1981, direct payments consisting of wages, salaries, and bonuses amounted to about 75 percent of total compensation in the United States and 77 percent in Japan. Indirect payments (nonmonetary benefits) consisting of paid leave, in-kind payments, and other nonpecuniary benefits amounted to about 17 percent in the United States and 15 percent in Japan, and legally required insurance, such as unemployment insurance, amounted to less than 8 percent in both countries. It is in the composition of direct payments, i.e., wages and salaries vs. bonuses, that one finds a sharp contrast between the two countries. Bonuses for production workers are extremely rare in the United States, amounting to less than 1 percent of total compensation, whereas in Japan they amounted to 21 percent of total compensation and more than 27 percent of direct compensation.

The importance of bonus payments appears to have increased in Japan over time, but in the United States, the trend appears, if anything, to be downward.[7] During the period examined in table 4.3, Japanese direct compensation declined in relative importance, but this decline was due solely to a declining proportion of wages and salaries (see rows (3) and (1)). The relative importance of the bonus in Japan increased between 1965 and 1971, while it remained unchanged between 1971 and 1981. Note also that both nonmonetary benefits and legally required insurance grew in importance in Japan as well as in the United States during this period. Finally, Japanese bonus payments do not appear to be incentive

Table 4.3 Structure of Compensation Costs for Production Workers in U.S. and Japanese Manufacturing Industries (Percent)

	Japan			United States		
	1965	1971	1981	1966	1972	1981
(1) Wages and Salaries	64.6	61.2	56.1	82.4	79.0	74.1
(2) Bonuses	18.2	21.3	21.3	0.6	0.5	0.4
(3) Sum of (1) and (2)	82.8	82.5	77.4	83.0	79.5	74.5
(4) Nonmonetary Benefits	12.3	12.3	15.1	11.4	14.4	17.5
Pay for Leave Time	3.2	3.2	4.5	5.6	6.2	6.7
Pay In-Kind	4.2	4.1	4.4	–	–	–
Benefits	4.9	5.0	6.2	5.8	8.2	10.8
(5) Legally Required Insurance	4.8	5.2	7.5	5.5	6.2	7.9
(6) Total	100	100	100	100	100	100

SOURCE: U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 150.

NOTES: Figures don't always add up to the indicated totals because of rounding. Wages and salaries include basic time and piece rates, plus overtime premiums and shift differentials. Bonuses include all bonuses and premiums not paid monthly. Pay for leave time includes pay for vacation, holidays, and personal leave. Sick leave pay is included in benefits. Pay in-kind includes the cost to the employer of goods and services provided free or at reduced costs, such as food or housing, or cash allowances paid in lieu of pay in-kind. Benefits include private benefit plans. Japanese data refer to regular employees in establishments with 30 or more regular employees.

payments, as conditions for receiving bonuses are rarely stated in employment contracts.[8]

I have argued elsewhere that bonus payments contribute to flexible wages in Japan (Hashimoto 1979; Hashimoto and Raisian 1987a). It should be noted, however, that flexibility is evident in all components of earnings. It is well-documented in the literature that the base wage in Japan is quite flexible, as it is renegotiated every spring at the time of *shunto* (spring offensive).[9] The greater wage flexibility in Japan, as compared to the United States, conforms to the prediction of the theory developed in chapter 2.

Earnings Profiles and Worker Investment in Human Capital

I have argued in chapter 2 that there is greater investment in human capital on the job in Japan than in the United States. The hypothesis is

that this greater investment is the result of lower transaction costs, which encourage the investment in information reliability and/or a lower cost of investing in employees' technical skills.

On-the-job investment in human capital is ubiquitous in Japanese firms. It is more extensive in larger firms, but its existence among medium-sized and small companies should not be understated (Hashimoto and Raisian 1985). It would be incorrect, though, to conclude that American workers have less human capital overall than Japanese workers, as many U.S. workers receive training through formal channels, such as business schools, prior to entering the labor market. The point here is that on-the-job investment is more important, relative to total investment, in Japan than in the United States.

The following quotation (Hanami 1981) effectively conveys the importance in Japan of investment in human capital on the job:

> . . . most of the employees are recruited when they are fresh out of high school or college; the Japanese educational system as a whole is oriented more toward general education than toward vocational training. Therefore, an enterprise must train its labor force, either in its own training facilities or on the job. During their long career at the same enterprise, workers are likely to be transferred from one job to another. They are trained and retrained, especially after each move . . . (pp.28–29).

This description is in sharp contrast with the tendency for U.S. employers to want their new hires to "come in the door having the craft, not trying to learn the craft," and to expect them to "contribute to the bottom line immediately."[10]

Earnings Profiles

Consistent with the claim that there is more investment in worker skills on the job in Japan than in the United States, Raisian and I found that earnings typically grow more rapidly with tenure for Japanese workers than for American workers (Hashimoto 1985). Also, firm-specific experience has a greater earnings-boost effect than other types of experience in Japan, the reverse of the U.S. pattern.

Table 4.4 Importance of Firm-Specific Job Experience in Earnings Profiles (Male Nonagricultural Workers in Japan and the United States)

	Growth in Earnings to Peak Year Due to:			
	Peak Year (1)	Total Experience (%) (2)	Firm-Specific Experience (%) (3)	Ratio (3)/(2) (4)
Japan				
Small Firms	24	235.6	150.4	.638
Medium Firms	33	267.4	141.0	.527
Large Firms	27	242.8	205.2	.845
United States				
Small Firms	25	140.0	57.9	.414
Medium Firms	30	98.6	28.9	.293
Large Firms	30	109.7	52.6	.479

SOURCE: This table is based on Hashimoto and Raisian (1985), table 6.

NOTE: These magnitudes are calculated from regression estimates of earnings profiles, holding constant schooling and union status (for the United States).

Table 4.4 documents these patterns. This table is excerpted from the findings reported in Hashimoto and Raisian (1985, table 6). We ran regressions of the logarithm of earnings on a number of variables, including years of tenure, total years of experience, and schooling. Using the estimated regression coefficients, we then constructed earnings profiles for typical workers in Japan and the United States up to the years when the earnings reached their peaks. Interestingly, the peak years, reported in column (1), are not very different between the two countries.

Column (2) reports the percentage growth in earnings between the first year of employment and the peak year. The magnitudes in column (2) represent $d(\log Y)/dj$ obtained as follows. Think of the logarithm of earnings, $\log Y$, as being generated by a function $f(j, n)$, where j is total years of experience and n is years of tenure. Then$(d\log Y)/dj =$

$\partial(\log Y)/\partial j + \partial(\log Y)/\partial n$, since $dn/dj = 1$ for a worker who stays with the firm until retirement. The terms on the right-hand side can be estimated as the regression coefficients b and c, respectively, in the regression: $\log Y = a + bj + cn + \ldots$.[11] A typical Japanese worker who continues to work in a small firm is estimated to experience an almost 236 percent growth in earnings. In contrast, earnings for an American counterpart are expected to grow by only 140 percent.

According to the human capital hypothesis, earnings grow with employment tenure because employees acquire both general and firm-specific experience. Columns (3) and (4) document the relative importance of firm-specific experience in the total earnings growth. The magnitudes in column (3) are calculated from $\partial(\log Y)/\partial n$ in the above equation. Column (4), which reports the ratios of column (3) to column (2), indicates that for the typical Japanese worker in a small firm almost 64 percent of the earnings growth – a little over 150 of the 235.6 percentage points – is due to firm-specific experience. For a U.S. counterpart, a little over 41 percent – about 58 of the 140 percentage-point growth in earnings – is attributable to firm-specific experience. Thus, firm-specific experience dominates general experience in raising earnings in Japan, but the opposite pattern is true in the United States. The same Japanese-American contrast is observed for medium-sized and large firms as well.[12]

Long-Term Employment

Investments in employment relationships result in long-term employment relationships. The so-called lifetime employment, *shushin koyo*, system in Japan exemplifies this connection. The term is obviously an exaggeration, as most workers do have to retire at a prespecified retirement age that is early by the American standard.[13] The term is a useful one nevertheless, because it conveys the notion of the long-term employment relationship that exists in Japan. To be sure, long-term employment is observed outside Japan as well, but it seems indisputable that the average Japanese worker stays with the same employer for a longer period of time than an American counterpart.[14]

The fact that Japanese workers don't change jobs as often as American workers was demonstrated in my earlier work with Raisian (Hashimoto and Raisian 1985, table 2). We found that in both countries job accumulations are concentrated in the early work years, but stabilize much sooner in Japan than in the United States. A typical Japanese male was estimated to hold slightly more than 4.9 jobs before retiring, in contrast to his American counterpart who was projected to hold about 11 jobs. For females, the comparable figures were a little over 5 for Japanese females and a little over 10 for American females.[15] These magnitudes indicate that job turnover over the life cycle is notably smaller in Japan than in the United States.

We reported another finding on the relative prevalence of long-term employment relationships. That evidence had to do with the proportion of workers who stayed with the same employers for 15 years (Hashimoto and Raisian 1985, table 1). We found that, of Japanese male workers who were 20–24 years old in 1962 and had worked five years or less by then, 45.1 percent were with the same employers 15 years later. The comparable magnitude for American male workers was 13 percent. Of those who had worked over five years by 1962, the proportion was more than 65 percent for Japanese males and about 30 percent for U.S. males. Similar contrasts were obtained for other age groups as well. Clearly, long-term employment has been more prevalent in Japan than in the United States. We also found that those with more than 10 years of tenure constituted a greater proportion of male employees in Japan than in the United States, for both small and large firms. In both countries, a greater proportion of employees was found to have long-term employment in larger companies. Also, long-term employment was found to prevail in Japan even among small firms, though to a smaller extent than in large establishments.

Finally, it should be kept in mind that job mobility in Japan has shown signs of increasing in recent years. As Aoki (1990) notes, some large Japanese firms, as well as foreign firms located in Japan, responded to the shortage of specialists and skilled workers by recruiting mid-career personnel. To what extent such a trend will spread to the overall labor

market in Japan, possibly phasing out the long-term employment practice there, remains to be seen.

Worker Investment in H·man Capital

How large are on-the-job investments in Japan and the United States? This question was addressed earlier (Hashimoto and Raisian 1988) by computing investment magnitudes for the two countries. Although this question is discussed in detail in our paper, it is worthwhile to bring together the evidence here, given its relevance to the present theory. Let me present the findings in as nontechnical a way as possible, leaving the technical procedure to the appendix to this chapter. A reader wishing to follow every step of the calculation procedure might find it useful to read the appendix first.

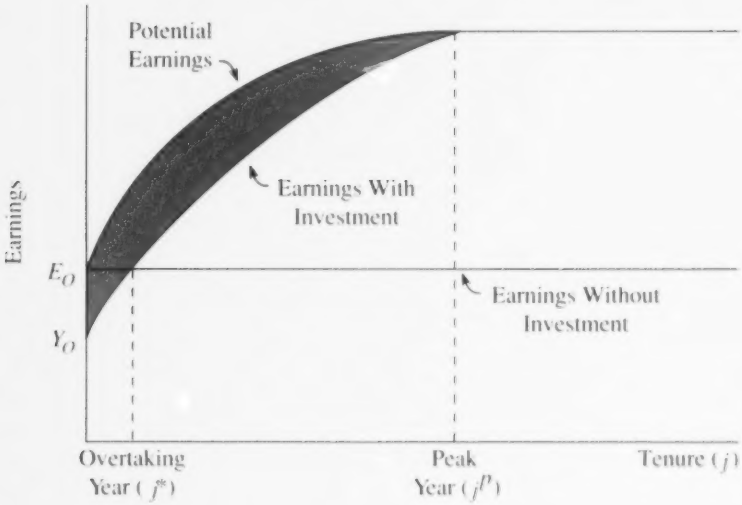
The computation procedure we used is based on Mincer's (1974) model, which in turn was an extension of the original model by Becker (1962). I summarize briefly the main points of the procedure by referring to figure 4.1. In that figure, workers who decide not to invest in human capital are assumed to earn a competitive value of E_0, or earnings without investment, throughout their careers. If they were to invest part of their potential earnings in any year, they would receive the values indicated by the schedule labeled "earnings with investment." The potential earnings in the jth year of tenure is given by $Y_j + C_j$. The overtaking year, j^*, occurs when the earnings with and without investment are equal to each other. Earnings peak at j^p for those who invest. Finally, the shaded area indicates the total amount invested in human capital. This amount is what was computed.

To perform the computation, it was necessary first to estimate earnings-tenure profiles, holding constant other determinants of earnings. The earnings profiles were estimated by ordinary least squares using the following familiar specification:

$$\ln Y = a + bg + cg^2 + dj + fj^2 + hX + u, \qquad (2)$$

where Y represents usual weekly wages for U.S. data and average

Figure 4.1 Earnings Growth and Investment



monthly earnings (including bonuses) for Japanese data; g is an estimate of years of previous experience (age minus education minus years of current job tenure minus six); j is years of tenure on current employment; X is a vector of control variables; u is the error term, and a, b, c, d, f, and h are parameters to be estimated.[16] For Japan, X stands for dummy variables for schooling categories. For the United States, X includes a union-status variable along with schooling variables.

Table 4.5 presents a summary of the characteristics of earnings profiles we estimated along with the computed values of investment magnitudes. The underlying data for Japan are from the *Chingin Kozo Kihon Chosa* (Basic Survey of Wage Structure) for 1980. These data are available as cell averages cross-classified by education, firm size, years of tenure, industry, age of worker, and occupation. Regression estimates were obtained by weighting each of the variables by the square root of the cell frequency. Data for the United States are from the May 1979 *Current Population Survey* containing observations on individual work-

ers. We restricted the sample to male workers in private nonagricultural industries for both countries.

As the chapter 4 appendix explains, the initial step in computing the investment magnitudes in table 4.5 is to select an appropriate overtaking year, which is when the current earnings of an investor become equal to those of a noninvestor. It was determined that five years is a plausible and theoretically consistent value (see the chapter appendix for this determination). Using this value for the overtaking year, earnings for a worker in a small Japanese firm in a nonagriculture sector are found to peak in the 13th year of tenure at a value of 293 thousand yen per month (column 1, table 4.5). The monetary value of investment is calculated to be 6.9 million yen, which is equivalent to 2.3 years' worth of time. The comparable investment magnitude for the United States is 1.3 years, a substantially smaller investment.

As for workers in large Japanese nonagricultural firms, the overtaking year of seven was chosen, using the procedure outlined in the chapter appendix. Using this value, the earnings are found to peak in the 25th year at a monthly value of 444 thousand yen (column 2, table 4.5). The monetary investment amounts to 19.3 million yen, or 4.8 years' worth of time, much larger than for workers in small companies. The comparable investment magnitude for the United States is 2.2 years. Thus, the firm-size difference in investment is larger in Japan than in the United States. The results for Japanese manufacturing firms generally conform to those for nonagricultural companies, but firm-size contrast in the United States is less clear for manufacturing than for the overall nonagricultural sector.[17] Evidently, workers in large U.S. manufacturing companies do not invest much more than those in small businesses.

It appears then that Japanese employees invest more in human capital than their counterparts in the United States. The investment in nonagricultural enterprises measured in years is almost 77 percent greater for small firms, and 118 percent larger for large companies, in Japan than in the United States. Interestingly, the rates of return were found to be rather similar for the two countries.[18] The investment magnitudes reported above refer to total investments. What is relevant to our theory, of course, is investment in firm-specific human capital. Under the

Table 4.5 Summary of Earnings-Tenure Profiles in Japan and the United States by Firm Size

	Nonagricultural Industries		Manufacturing Industries	
	Small Firms	Large Firms	Small Firms	Large Firms
Japan:				
Overtaking Year	5	7	5	7
Peak Year	13	25	13	30
Monthly Earnings in Overtaking Year	213.41	241.11	194.93	223.83
Monthly Earnings in Peak Year	292.84	444.20	278.10	480.05
Estimated Investments				
– In Thousands of Yen	6,942	19,313	7,269	22,271
– In Years	2.3	4.8	2.6	5.5
United States:				
Overtaking Year	5	6	5	5
Peak Year	20	30	25	31
Weekly Earnings in Overtaking Year	275.98	322.12	268.91	312.84
Weekly Earnings in Peak Year	338.22	445.38	360.12	418.43
Estimated Investments				
– In Dollars	19,209	41,564	25,807	28,838
– In Years	1.3	2.2	1.7	1.6

SOURCES: Summarized from Hashimoto and Raisian (1987a,b, 1988). The underlying data are: for Japan, the *Basic Survey of Employment* (1980); and for the United States, the *Current Population Survey* (May 1979).

NOTES: The dependent variables in the underlying regressions are the natural logarithms of monthly earnings (including bonus payments) measured in thousands of yen and usual weekly earnings measured in dollars for Japan and the United States, respectively. The explanatory variables include tenure, previous experience, schooling, and union status. The samples are for male workers. Small firms are those with 1–99, and large firms with 1,000 or more, regular employees.

standard assumption that the amount of firm-specific human capital is positively associated with total investment, the above findings of greater worker investment in total human capital implies that there is greater worker investment in firm-specific human capital in Japan than in the United States.[19]

Before leaving table 4.5, one limitation of the data used for the calculations should be noted. In particular, the above calculations use only the data on earnings and ignore payments to pension funds and to other fringe benefits. It is possible that the returns to investments accrue in these payments as well as in earnings. Unfortunately, the available data do not contain enough information on these payments to facilitate their inclusion in the calculation procedure. If the size of the shaded area in figure 4.1 is positively associated with these other payments, our Japanese-American and firm-size comparisons are valid.[20]

The above results reinforce the evidence based on bonus payments, which were found to be more extensively used in Japan than in the United States (see table 4.3). Therefore, the investment magnitudes just discussed can be viewed, together with the greater prevalence of bonus payments in Japan than in the United States, as supporting the prediction of our theory that Japanese workers invest more in the employer-employee relationship than do their American counterparts.

Sensitivity of Labor Inputs to Output Changes

Temporary workers, day laborers, and female workers in Japan experience greater volatility in employment than male regular workers, providing cushions for demand fluctuations in the long-term employment environment for regular workers. Table 4.6 documents this tendency, using the data for the manufacturing industry.[21] It reports the regression results relating year-to-year changes in employment to similar changes in output, separately for regular workers and temporary workers and day laborers. The coefficients associated with output indicate the extent of employment sensitivity in elasticity terms. For example, the output coefficient for male regular workers of 0.3121 indicates

Table 4.6 Employment Sensitivity to Changes in Output Japanese Manufacturing, 1959–88

	Coefficient	Regular Workers	Temporary Workers and Day Laborers
Males			
	Output	.3121	.6152
		(4.84)	(1.68)
	Constant	−.0102	−.0482
		(−1.47)	(−1.22)
	R-Square	.445	.061
Females			
	Output	.5570	.9149
		(4.49)	(3.11)
	Constant	−.0291	−.0283
		(−2.16)	(−.89)
	R-Square	.406	.236

SOURCES: *Rodoryoku Chosa* (Labor Force Survey) as reported in *Japan Yearbook of Labour Statistics*, 1988, 1989, 1990. The output data are from U.S. Bureau of Labor Statistics, *Handbook of Labor Statistics* (1989), table 146.

NOTES: Figures in parentheses are *t*-values. Coefficients are OLS estimates of a and b in $Dy = a + bDz + e$, where Dy and Dz are year-to-year changes in the logarithm of, respectively, the dependent variables and manufacturing output, and e is the regression error term.

that a 1 percent increase in the rate of output production is associated with a one-third percent increase in the employment of regular workers.

It is clear that, for both sex groups, temporary workers and day laborers exhibit greater employment sensitivities to output changes than regular workers. Note also that the output coefficient for male regular workers is about 78 percent of the coefficient for female regular workers (0.3121 vs. 0.5570), is almost half the size of that for male temporary and day laborers (0.3121 vs. 0.6152), and one-third the size of that for female temporary and day workers (0.3121 vs. 0.9149). Evidently, female temporary workers and day laborers experience the most volatility in employment of the four groups studied in table 4.6. A similar regression for U.S. manufacturing employment reveals an output sen-

sitivity of 0.5802.[22] It is interesting that output sensitivities for male temporary workers and female regular workers in Japan are similar to the output sensitivity for the American workers as a whole. Male regular workers in Japan do experience the least employment sensitivity to changes in output.

The regression results in table 4.6 suggest that the lifetime employment of Japanese male regular workers is supported by the cushions provided by female workers and temporary and day workers. These regressions are rather simplistic, however. They do not distinguish employment responses to anticipated and unanticipated changes in the rate of production, for example. It is also desirable to incorporate the possible interdependence among employment, hours of work, and inventories.

We saw earlier that male manufacturing workers in Japan invest more in firm-specific human capital than do those in the United States.[23] If so, the sensitivity of labor inputs to changes in demand should differ systematically between the two countries. In particular, employment should be less responsive, and hours of work and inventories more responsive, to changes in the product demand for Japanese than for American workers. How does the pattern of sensitivity in labor input differ between the countries? Does it depend on whether changes in product demand are anticipated or unforeseen? Is there evidence that the Japanese response pattern changed after the slowdown in its economic growth in the early 1970s?

To investigate these questions, I adopt the labor demand model developed by Topel (1982), which is an extension of the interdependent factor demand model originally developed by Nadiri and Rosen (1973).[24]

The model contains three equations corresponding to three endogenous variables: employment, hours of work, and inventories. Inventories are relevant for employment adjustments.[25] A firm has a choice of responding to fluctuations in its product demand by adjusting its current level of labor use, changing its inventories, or engaging in a combination of both. Also, faced with an increase in the forecasted future demand for its product, the firm may not want to wait for the increased

demand to materialize before increasing its output. Instead, it may hire more workers now and/or ask the existing workers to work overtime to build up inventories. These considerations suggest that the exogenous variable in the model is the product demand, and it is represented here by forecasted values of shipments as well by the unforeseen deviations in the current shipments from its forecasted value.

The model consists of three interdependent demand equations as follows:

$$E_t = f_e[E_{t-1}, H_{t-1}, I_{t-1}, X_{t-1}, \epsilon \sum_{0}^{T} \beta_{1j} q_{t+j}, \hat{q}_t, \text{Time Trend}] \quad (3)$$

$$H_t = f_h[E_{t-1}, H_{t-1}, I_{t-1}, X_{t-1}, \epsilon \sum_{0}^{T} \beta_{2j} q_{t+j}, \hat{q}_t, \text{Time Trend}] \quad (4)$$

$$I_t = f_i[E_{t-1}, H_{t-1}, I_{t-1}, X_{t-1}, \epsilon \sum_{0}^{T} \beta_{3j} q_{t+j}, \hat{q}_t, \text{Time Trend}] \quad (5)$$

where f's indicate that the left-hand side variables are functions of the variables appearing in the brackets; E_t, H_t, and I_t are employment, hours of work at time t (month), and inventories; X_t stands for inventories of intermediate stocks and materials; ϵ denotes the expected values; β's are the coefficients associated with the future values, q_t+j, of shipments; and $\hat{q}_t$ is unanticipated current demand.[26] All of the variables except the time trend variable are measured in natural logarithms.

The specification above is known as an interdependent stock-adjustment model of factor demand. The underlying theoretical model and the associated optimization problem are discussed in Topel (1982) and will not be repeated here. The expectation operator, ϵ, refers to expectations formed by using the information available each month. The planning horizon, t, was specified alternatively as four months, six months, and nine months, but the findings differed little among those specifications.[27] As a result, only the findings based on the nine-month horizon are reported. The exogenous variable in the model is output demand as measured by the forecasted shipments, q_t, and by unforeseen deviations in the current shipments, $\hat{q}_t$. Firms are assumed to choose the magnitudes of the endogenous variables by taking into account the

forecasted current and future demand as well as unforeseen deviations in the current demand.

To construct the forecasted values of future shipments, it is assumed that they depend only on the past values of shipments and not on other endogenous variables. Since the underlying data are monthly, one must take account of seasonality. As a result, various seasonally differenced integrated-autoregressive-moving-average processes (ARIMA) were investigated, and the best ones were chosen to generate the forecasted values of shipment, ϵq_t, which in turn are used as explanatory (exogenous) variables in estimating equations (3) through (5).[28]

Before discussing the estimation of the model and the findings, let me address some problems in comparing data on employment, hours of work, and inventories between Japan and the United States. First, as noted in chapter 3, Japanese workers who are temporarily laid off (*ichiji kyugyosha*) are counted as employed persons, but in the United States such persons would be counted as unemployed.[29] This difference is potentially troublesome for comparing the employment sensitivity to demand changes in the two countries. In particular, one would not detect in the Japanese data changes in employment due to temporary layoffs, as one would in the U.S. data. Thus, an estimate of employment sensitivity would be understated for Japan.

Although one should keep a healthy respect for this problem, it should be noted that temporary layoffs are rather rare in Japan. For example, those who are temporarily out of work for *any reasons* (*kyugyosha*) amount to only about 2 percent of regular workers.[30] The ratio of male *ichiji kyugyosha* to male regular workers, if the data were available, almost surely would be much less than 2 percent. Therefore, I do not consider this issue to be serious enough to discourage a comparison of the employment sensitivity in the two countries as long as one bears in mind the potential for understating it for Japan.[31]

The second issue concerns hours of work. Abraham and Houseman (1989) caution that the difference in the definition of hours of work between the two countries may distort a comparison of the hours coefficient: hours data refer to actual hours worked for Japan but to paid hours for the United States. For example, changes in the vacation

schedule alter the actual hours of work while keeping paid hours unchanged. To the extent that this adjustment mode is used in both countries, the difference in the definition of hours of work would make the hours coefficient apparently smaller for the United States than for Japan even if, in fact, it were the same.[32]

There is yet another difficulty with the hours data for Japan. As noted in chapter 2, typical Japanese regular workers spend a great deal of time with their colleagues and superiors after work hours talking about various aspects of work and personal lives over food and drinks, and generally investing in the employment relationship.[33] Such expenditures of hours are unlikely to be reported in the data. Thus, the hours of work data for Japan tend to understate the true numbers of hours that typical workers spend in the marketplace, though perhaps the data accurately measure the actual hours directly spent on production. Total hours of work, including the informal time spent investing in the employment relationship, may respond less to changes in the demand for output than the hours spent on production.

Turning to the third issue, it is generally agreed that Japanese firms are less vertically integrated than American firms, with the former relying on subcontractors to perform many of the production activities. As a result, some of the inventories, which would be counted as input inventories in U.S. firms, may be counted as output inventories in Japanese firms.[34] If the response of output inventory to output demand differs from that of input inventory to input demand, a comparison of inventory behavior for the two countries could be distorted, since the distinction between the two is ignored here.

Given the preceding difficulties in comparing data for the two countries, one needs to be cautious in interpreting the estimate of the model. If we were to find that the estimated employment sensitivity, which may be an underestimate of the true sensitivity in Japan, is greater in Japan than in the United States, we would have clear evidence refuting the prediction of our theory. However, if we were to find an opposite pattern – namely, that employment sensitivity is smaller in Japan than in the United States – we could not claim such findings to be conclusive. Instead, we could say only that the findings are consistent with the

theory's predictions. Similarly, our test can offer conclusive evidence only *against*, but not *in support of*, the prediction of the theory regarding hours sensitivity: by finding that the estimated hours sensitivity, which may be an underestimate of the true value for the United States, is greater in the United States than in Japan, one would judge against the theory's prediction.

The data used to estimate the model for both countries are monthly establishment data, seasonally unadjusted, for the manufacturing sector. Japanese data refer to regular workers for both sexes and U.S. data, to all workers. Unfortunately, the monthly U.S. data are not available by sex. The Japanese data are gathered from Japan Economic Planning Agency, *Annual Report on Business Cycle Indicators*, and the U.S. data from the Bureau of Economic Analysis, *Business Statistics 1986*, *A Supplement to the Survey of Current Business* and the *Citibank Data File*.

Of immediate interest are the coefficients associated with forecasted current shipments, those for forecasted future shipments ($\Sigma\beta_{1j}$, $\Sigma\beta_{2j}$, $\Sigma\beta_{3j}$, $j=1, 2, \ldots$), and those for unforeseen current demand shocks. The estimated coefficients are reported in table 4.7. It should be mentioned at the outset that the forecasting model estimate was less successful for Japan than for the United States.[35] The causes for the poor Japanese results—undoubtedly hidden in the data used—could not be determined. The poor performance of the Japanese forecasting equation needs to be kept in mind when evaluating the findings.

Estimates of equations (3) through (5) were all statistically significant according to the *F* statistics (available upon request). In table 4.7, all coefficients are interpreted as elasticities. The coefficients associated with the short-run product-demand variables—the forecasted current demand and unforeseen deviations in the current demand from its forecasted value—are of direct interest. Although firms must have anticipated that there would be some deviations in the actual from the forecasted demand, the exact magnitude of the realized deviation is in fact unforeseen. As such, firms will respond by changing labor usage and the inventory level.

The theory predicts the coefficients for the labor input variables—

Table 4.7 Adjustments of Labor Inputs to Demand

	Japan			United States		
	Employment (E_t)	Hours (H_t)	Inventories (I_t)	Employment (E_t)	Hours (H_t)	Inventories (I_t)
Forecasted Shipments						
(1) Unforeseen	0.0885	0.1200	−0.1073	0.2640	0.0950	−0.0705
Deviations	(1.88)	(1.57)	(−1.34)	(2.99)	(2.55)	(−1.89)
(2) Current	0.0472	0.1423	−0.1811	0.1214	0.0053	0.0049
	(3.47)	(1.88)	(7.80)	(4.05)	(0.41)	(0.37)
(3) Future	−0.0555	−0.0070	−0.0975	−0.0745	0.0891	0.0247
	(1.89)	(0.12)	(2.01)	(1.50)	(4.18)	(1.16)

SOURCES: The magnitudes are based on author's calculation using data from the following sources: Japan Economic Planning Agency, *Annual Report on Business Cycle Indicators* (August 1987); the computer data bank, *Citibank Data File*; U.S. Department of Commerce, The Bureau of Economic Analysis, *Business Statistics 1986, A Supplement to the Survey of Current Business*, 1987.

NOTES: Numbers in parentheses are *t*-values. The unforeseen deviations represent the difference between the actual shipment and the forecasted current shipment. The forecasted future shipment variables are based on nine-month forecasts, and the coefficients for future shipments are the sum of the coefficients for the eight months following the current month. The unanticipated shipment variable is the difference between the actual shipments and the current forecasted shipments.

employment and hours of work – associated with the current demand variables to be positive and the coefficient for inventories to be negative. In other words, when the current product demand increases, employers increase both employment and hours of work, but reduce inventories, to meet the increased demand. As for coefficients associated with the forecasted future demand, or long-run changes in demand, the theory predicts coefficients for labor inputs and inventories to be all positive. Thus, when the future demand is expected to increase, firms begin building up inventories by increasing production now, and the increase in the current production entails increases in labor inputs. Also, to the extent that new employees need to be trained, companies may begin hiring in advance of future increases in demand. As will be seen, however, the findings associated with the forecasted future demand turn out to be weak and uninformative.

The results of direct interest for this study concern coefficient differ-

ences between Japan and the United States and among the equations for employment, hours of work, and inventories. If there is a higher fixity of employment cost due to greater investments in firm-specific human capital in Japan than in the United States, one would predict the following patterns of contrast in the coefficients for the unforeseen deviations in the current demand and for the current demand itself: (1) the coefficients for employment would be smaller in Japan; (2) the coefficients for hours of work and inventories would be greater in Japan; and (3) the coefficients for hours of work and inventories would be larger than those for employment in both countries. This last prediction follows from the usual premise that a higher fixed cost is associated with employment changes more than with changes in either hours of work or inventories.

The coefficients reported in table 4.7, rows (1) and (2) are consistent with the predictions except for the positive – but statistically insignificant – inventory coefficient in row (2) for the United States. The coefficients in row (1) indicate that employment responds much less to unforeseen deviations in the current demand in Japan (0.0885 and barely significant) than in the United States (0.2640 and significant). The same pattern of difference holds for the coefficient for the forecasted current demand (row (2)), with Japan having the coefficient of 0.0472 and the U.S., 0.1214, both statistically significant.

The weak employment response in Japan to short-run changes in product demand in contrast to the U.S. situation, in which employment responds significantly to these demand changes, is consistent with there being a greater fixity of employment in Japan than in the United States. Note also that for both unforeseen deviations and for the current demand, the Japanese coefficients for hours of work and inventories are nominally (in absolute values) larger than for employment, but the opposite pattern is observed for U.S. coefficients. In fact, the U.S. coefficients for inventories are statistically insignificant. It appears, therefore, that Japanese manufacturing firms rely more on adjustments in hours of work and inventories *relative* to employment adjustment than their U.S. counterparts when faced with short-run changes in product demand. These findings are consistent with the proposition than in

Japanese manufacturing high employment-cost fixity discourages the use of employment adjustments to short-run changes in demand.

According to table 4.7, in the hours equation the coefficient associated with unforeseen deviations in shipments is only slightly larger for Japan than for the United States (0.1200 and 0.0950). In the same equation, the coefficient for current demand is much larger for Japan than for the United States (0.1423 and 0.0053), but it is insignificant for both countries. In a recent paper, Abraham and Houseman (1989) concluded that the average hours in Japanese manufacturing adjust no more, and possibly less, than those in U.S. manufacturing. The findings in table 4.7 suggest that the average hours in Japanese manufacturing adjust slightly more than in U.S. manufacturing. The minor differences between their findings and mine, undoubtedly, are related to differences in the model specification and in the data used.[36]

Given the difficulties of comparing the hours measure in the two countries, the extent of distortions in the comparison of the hours coefficient between the two is difficult to determine. What the findings in table 4.7 suggest, then, is that Japanese manufacturing relies *relatively* more on adjustments in inventory and in hours of work spent directly on production activities, while U.S. manufacturing relies *relatively* more on employment adjustment. It is noteworthy that the findings do not contradict the predictions of the theory. Given the problems associated with the employment and hours data noted earlier, however, the finding that the estimated employment and hours coefficients conform to the pattern predicted by our theory must be viewed with caution.

The coefficients for future shipments are mostly insignificant, and the signs for the coefficients are uninformative in row (3). Although our immediate interest is in the response coefficients to short-run changes in product demand, the rather ambiguous findings for the future shipment variable is disappointing. I have tried various equation specifications and forecasting mechanisms, but to no avail. These coefficients are based on a nine-month time horizon, but the coefficients based on three- and five-month horizons also were found to be insignificant. Taken literally, this finding suggests that the current level of input use, and particularly of employment, is not affected by forecasted future de-

mand, a difficult proposition to accept. Moreover, the negative sign in the Japanese inventory equation is the opposite of the theoretical expectation.[37] These anomalous findings are in contrast to the more sensible findings for short-run changes in product demand reported in rows (1) and (2). A plausible reason for the anomalies is that the estimated forecasting equation for Japan performs more poorly in forecasting future shipments than current shipments. If so, the forecasted future demand variables would contain an unknown number of measurement errors, and such errors would cause statistically insignificant estimates.

Japanese Experience in the Post-1975 Years

Japan experienced a rather drastic contraction in the growth rate of her economy after the first "oil shock," which began in late 1973.[38] As a result, many firms had to make major – and sometimes painful – adjustments in the utilization of labor. An important public policy response to this situation took place in 1975 in the form of the Employment Insurance Law. This law shifted the emphasis away from the usual concept of an unemployment insurance subsidy directly provided to unemployed workers to a system in which subsidies are given to employers, who, in turn, provide compensation to workers on furlough. A noteworthy aspect of this law was that it enabled the furloughed workers to remain "employed" by the firm (Cole 1979; Taira and Levine 1985). Also, the law provided for subsidies in circumstances where employers wished to implement short-time schedules (Sorrentino 1976).

The changes that the Japanese economy experienced in the mid-1970s can be viewed as the emergence of cyclical labor markets. In the regime of high rates of economic growth such as those which prevailed in Japan before 1970, changes in output demand were likely to be viewed as reflecting long-run, or permanent, changes. After the mid-1970s, however, the rate of growth slowed substantially, and demand changes came to be viewed more as short-run business-cycle phenomena than permanent changes.[39]

To investigate if the interrelated factor demand functions shifted after mid-1970, I estimated the equations for employment, hours of work,

Table 4.8 Adjustments of Inputs to Demand Shocks in Japan
(Split Sample: January 1967–December 1974 and January 1975–December 1986)

	Employment (E_t)		Hours (H_t)		Inventories (I_t)	
	Pre-1975	Post-1975 Contrast	Pre-1975	Post-1975 Contrast	Pre-1975	Post-1975 Contrast
Forecasted Shipments						
(1) Unforeseen Deviations	0.1663	−0.1295	−0.0623	0.1947	−0.2294	0.2372
	(2.72)	(−1.60)	(−0.71)	(2.07)	(−1.93)	(1.51)
(2) Current	0.0730	−0.0423	−0.1510	0.0955	−0.2466	0.0957
	(3.71)	(1.72)	(1.38)	(0.67)	(6.44)	(2.00)
(3) Future	−0.0036	−0.0853	0.2726	−0.2342	−0.0173	−0.1354
	(0.10)	(1.66)	(3.08)	(2.09)	(0.23)	(1.36)

SOURCES: The magnitudes are based on author's calculation using data from the following sources: Japan Economic Planning Agency, *Annual Report on Business Cycle Indicators* (August 1987).

NOTES: Numbers in parentheses are *t*-values. The unforeseen deviations represent the difference between the actual shipment and the forecasted current shipment. The forecasted future shipment variables are based on nine-month forecasts, and the coefficients for future shipments are the sum of the coefficients for the eight months following the current month. The unanticipated shipment variable is the difference between the actual shipments and the current forecasted shipments.

and inventory (equations (3) through (5)) by splitting the sample as of December 1974, and allowing all the coefficients, except for the intercept, to differ between the pre- and post-1975 years. The key coefficients are summarized in table 4.8. In this table, the columns labeled "post-1975 contrast" indicate the changes in the coefficients after January 1975. The F statistics for Chow test (not reported) indicate that the difference in the demand functions between the two periods is indeed statistically significant at conventional levels. Although not all of the coefficient differences are significant, some interesting patterns emerge.

If Japanese firms came to view demand changes more as cyclical and short-run phenomena rather than permanent phenomena after 1975, then one would expect the employment sensitivity to short-run demand changes to have decreased and the sensitivities of hours of work and inventories to have increased. Therefore, the coefficients of immediate

interest are those for the post-1975 contrast. As table 4.8 shows, the signs for the coefficients for both the forecasted current demand and unforeseen deviations in the current demand agree with this proposition (rows (1) and (2)), though not all of the coefficients are statistically significant.[40]

Taking the estimated coefficients at face value, employment appears to have become less sensitive to, and hours of work and inventories more sensitive to, short-run demand changes. On balance, therefore, the findings in rows (1) and (2) in table 4.8 point to the validity of the proposition in question, though the case is far from being watertight. As for the forecasted future demand reported in row (3), again the findings are as uninformative as those in table 4.7. The coefficients for hours of work and inventories have opposite signs to those which would be expected, *and* the coefficient for hours of work is statistically significant.

Summary

Our finding of greater ambiguity in Japan than in the United States for the distinction between quits and dismissals is indirect evidence for the proposition that transaction costs are lower in Japan. If so, theory posits that there is more investment in employment relationships in Japan than in the United States. The importance of bonus payments, the power of firm tenure in raising earnings, the prevalence of long-term employment, all point to the validity of this prediction. The investment magnitudes calculated from earnings-tenure profiles also agree with this prediction. In particular, Japanese male workers evidently invest more in the employer-employee relationship than do their American counterparts.

Consistent with the investment difference, Japanese employers seem to rely less on employment adjustments, and more on adjustments in hours of work and inventories, than U.S. employers when faced with changes in product demand. Indeed, employers in the United States appear to rely primarily on employment adjustments to address these

changes. The greater reliance on employment adjustment in U.S. manufacturing than in Japanese manufacturing undoubtedly contributes to the higher unemployment rates observed in the United States than in Japan, though the extent of such a contribution remains an open question.

Factor demand functions evidently shifted in Japan after the first oil shock of 1973. Although not overwhelming, the evidence by and large points to the conclusion that after 1975 changes in demand came to be viewed by the decisionmakers as temporary cyclical phenomena, whereas before 1975 such changes tended to be viewed as permanent.

Chapter 4 Appendix
Analytical Framework of Earnings Profiles

This appendix sketches the analytical framework and the procedure used in estimating the magnitudes reported in table 4.5. The following discussion is a review of the procedure discussed in greater detail in Hashimoto and Raisian (1988).

The slope of an earnings-tenure profile is frequently used as the sole measure to describe the profile. Comparisons based only on slope differences can be misleading, however. A greater slope does not necessarily mean a greater investment in human capital. It is desirable, therefore, to examine a multitude of attributes to adequately describe the underlying properties of the wage-tenure profile. To account for the necessary attributes, Mincer's model (1974) is adopted here.

Suppose a typical worker in the absence of human capital investment would earn a competitive wage of E_0 throughout his or her career. This profile is depicted in figure 4.1. If the worker were to invest a portion of his or her earnings potential in any period, observed earnings for the jth year of tenure would amount to:

$$Y(j)=E_0+\sum_{t=0}^{j-1} r(t)C(t)-C(j), \tag{1}$$

where $r(t)$ and $C(t)$ are, respectively, the rate of return and the amount of foregone earnings invested in year t. This relation is also displayed in figure 4.1, where $Y(j)$ is referred to as earnings with investment. Figure 4.1 also indicates the potential earnings of the individual during the jth year of tenure, i.e., Y_j+C_j. At the peak level of observed earnings, occurring at j^p, investment in human capital ceases and $C(j^p)=0$. It follows, assuming that $r=r(t)$ for all t, that

$$Y(j^p)=E_0+r\sum_{t=0}^{j^p} \tag{2}$$

Total investment in monetary units is then given by:

$$\sum_{t=0}^{jp} C(t) = \frac{Y(jp) - E_0}{r}. \tag{3}$$

Total investment is depicted as the shaded area in figure 4.1, and depends on earnings in the peak year, earnings capacity without human capital accumulation, and the rate of return on investment.

Investments can also be measured in units of time. Defining the proportion of work time that an individual invests as $k(j) = Cj/Ej$ with $E_j = Y_j + C_j$, after some algebraic manipulations one obtains:

$$\ln Yj = \ln E_0 + r \sum_{t=0}^{j-1} k(t) + \ln[1 - k(j)] \tag{4}$$

and

$$\ln Y(jp) = \ln E_0 + r \sum_{t=0}^{jp} k(t). \tag{5}$$

The sum of the fractions of time invested is then given by:

$$\sum_{t=0}^{jp} k(t) = \frac{\ln Y(jp) - \ln E_0}{r}, \tag{6}$$

and depends on the very same variables, transformed differently, as the monetary investments. Investments measured in monetary and time units, in (3) and (6) respectively, can be compared across countries as well as across firms of different sizes.

The estimation of the above model requires magnitudes that are not readily observable, namely, the alternative earning capacity, E_0, and the rate of return on investments, r. To overcome this problem, we focus initially on Mincer's (1974) concept of the overtaking year, j^*, the year where observed earnings, $Y(j^*)$, are just equal to the earning capacity in the absence of investment, E_0 (see figure 4.1). If Cj declines with tenure, as is expected theoretically, the overtaking year is bounded above by the following relationship:

$$j^* < \frac{1}{r}. \tag{7}$$

For example, if the rate of return on investment is 10 percent, it will take less than 10 years for a worker who invests to overtake a similar worker who does not. To determine the rate of return, we solve for internal rates of return, i, by equating the present values of observed earnings with and without investments. This condition ensures the existence at the margin of both types of workers in equilibrium. The rate of return, r, is given by the relation:

$$r = \frac{i}{[1 - 1/(1+i)^N]}, \tag{8}$$

where N is the last year of employment (see Blinder 1976). It is clear that $r > i$ and as N becomes large, r approaches i.

Thus, our estimate begins by selecting an arbitrary overtaking year, j^*, and then calculating the rate of return. A check is then performed to see whether the inequality in (7) is satisfied; if it is not, that overtaking year is discarded. Also, based on existing estimates of returns on post-school investments, we discard those overtaking years that imply a rate of return exceeding 30 percent. For an eligible overtaking year, estimates of investments are obtained from (3) and (6).

There is another complication. Once we calculate total investments for a particular j^* for, say, small firms, what values of j^* should be used to calculate and compare the investment magnitudes for medium and large firms? We dealt with this question by selecting the overtaking years for medium and large firms by fixing the respective E_0's so as to equalize rates of return across the firm-size groups. [41] Once E_0 is established for either medium or large firms, the overtaking year can be inferred and the investment magnitudes calculated.

Although our empirical work specifies an earnings profile that rises in a quadratic pattern with tenure, we only use the information up to the peak of the profile. In other words, depreciation, which eventually brings down the wage profile, is not considered here.

NOTES

[1] Workers who separated for reasons of "own misdeed" are classified as quits, because in Japan they are likely to resign rather than be fired. Classifying those as dismissed does not change the qualitative findings reported here.

[2] Recall that regular workers constitute the bulk of the employed workers in Japan (chapter 2).

[3] The trend line for the real gross national product was estimated as a function of a time variable and its square term.

[4] The reader is reminded that the all-industry data for the United States refer to the stock of unemployed workers grouped by reason for unemployment, and therefore are not directly comparable to other data, all of which refer to flow of separated persons.

[5] Regression analyses reveal that the bonus-earnings ratio increases with the educational attainment of workers, firm size, and tenure in the firm. Regression estimates are remarkably stable for years 1967, 1970, 1976, 1980, and 1981. For details of these analyses, see Hashimoto (1979) and Hashimoto and Raisian (1987a,b).

[7] Although bonus payments take place in other developed countries, Japanese bonus proportions rank highest among the developed countries. For example, as of 1978, bonuses amounted to 8 percent of total compensation and 12 percent of direct compensation in West Germany, and 6 percent and 10 percent, respectively, in France. The United Kingdom and Canada as well as the United States exhibited only small bonus payments. Korea also has bonus payments. According to the recent research by Ito and Kang (1989), Korean bonuses began to appear around 1971. The bonus-wage ratio is still low as compared to Japan, but it has been increasing since the early 1970s, and by the early 1980s, the Korean ratio stood at about half of the Japanese ratio.

[7] At this writing, there is some indication that the U.S. trend may be reversing, as firms increasingly try to tie wages to performance. (See, for example, "GM's New Compensation Plan Reflects General Trend Tying Pay to Performance," *The Wall Street Journal*, 26 January 1988.)

[8] In contrast, bonuses in the early years of industrialization, i.e., during the turn of the century, tended to be incentive payments. Recall the related discussion in chapter 3.

[9] See Gordon (1982), Hashimoto and Raisian (1987a,b), and Taylor (1989). See chapter 3 for a discussion on *shunto*.

[10] These quotes are from "Labor Letter," *The Wall Street Journal*, 25 August 1987.

[11] Actually, the estimated regression includes j^2 and n^2 as well. Also, the magnitudes in table 4.4 are corrected for the fact that a change in the logarithm of Y is not the same as the percentage change in Y. For example, a percentage change from Y_0 to Y_1 is given by $(Y_1 - Y_0)/Y_0$, which equals $Y_1/Y_0 - 1$. A change in the logarithm of Y, $d\log Y$, is $\log(Y_1/Y_0)$, so that the correct measure of percentage change is $\exp(d\log Y) - 1$.

[12] Note that the relative importance of firm-specific experience is greater in large firms than in small firms, though the medium-sized companies tend to break this pattern for unknown reasons. The reader is also referred to a recent article by Mincer and Higuchi (1988), in which they find from microdata sets that upwards of two-thirds of the difference in turnover data between Japan and the United States is explained by the steepness of earnings-tenure profiles. Their analysis indicates that Japan's rapid economic growth – and rapid technical change, in particular – was a factor in the emphasis on human capital investments on the job.

[13] As we saw in chapter 3, mandatory retirement used to occur at about 55 years of age, but the retirement age has been increasing for the past 15 years or so. Many firms now retire workers closer to age 60.

[14] For the extent of long-term employment in the United States, see Koike (1977, 1988), Hall (1982), and Hashimoto and Raisian (1985). It is usually thought that smaller firms have higher failure rates; if so, smaller businesses are expected to have shorter durations of employment on average. A potentially contrary piece of evidence should be kept in mind, however. Cole (1979, 87–90) reports that the proportion of workers in Yokohama who are job-leavers due to involuntary discharge – presumably including business failures – tend to be highest in the largest companies and lowest in the smallest businesses. No information is available, however, on the proportion of those discharges due to business failures.

If failure rates were the predominant factor, competition would lead to higher wages in smaller firms. Since wages tend to be lower in smaller companies, there must be more to firm-size differences. As another factor, employees in larger firms have greater opportunities to change jobs without changing employers. Indeed, Cole (1979, 80–81) found that intrafirm mobility increases with firm size in both Yokohama and Detroit. Idson (1989) found that in the United States there is more intrafirm mobility in larger establishments.

[15] Interestingly, the pattern of male-female difference appears opposite in the two countries. In the United States, males hold a greater number of jobs than females throughout their lives, but in Japan females hold more jobs. This pattern may reflect, in part, the fact that in Japan the lifetime employment practice applies mostly to males, and that females serve as a cushion for employment fluctuations.

[16] The quadratic tenure and experience terms are consistent with the fraction of time, $k(t)$, which declines linearly with t. See Mincer (1974).

[17] In the original paper, we also reported the results for medium-sized firms with 100–999 employees. The computed values of investments increased monotonically with firm size for nonagriculture enterprises in both countries and for manufacturing in Japan, but the pattern was mixed for U.S. manufacturing. There, the investment magnitude for medium-sized firms was the smallest (1.5 years) and, as shown in table 4.5, the contrast between small and large companies was weak.

[18] Computed rates of return on investments were rather similar for the two countries: 13 percent for Japan and 16 percent for the United States in nonagriculture sectors, and 13 percent for Japan and 17 percent for the United States in manufacturing. Firm-size differences in rates of return could not be ascertained, because our procedure by construction equalizes the rates of return across firm-size groups.

[19] However, see Hashimoto and Raisian (1988) for an attempt to decompose investment magnitudes into firm-specific and general components.

[20] Japanese firms pay annuities, a lump-sum amount, or a combination of both. Raisian and I calculated pension values for nonagricultural workers in large firms (those with 1,000 employees or more) in Japan and the United States. We then added them to the estimated investments in human capital. The result still shows that Japanese workers have greater investments than their American counterparts. Unfortunately, comparable data are not available for manufacturing. See Hashimoto and Raisian (1988).

[21] Table 4.6 updates the regression estimates reported in Hashimoto and Raisian (1987a,b, 1988).

[22] The output coefficient for U.S. manufacturing is 0.5802 (9.6), the constant is −0.0118 (2.9), and the R-square is 0.75. The values in parentheses are t-values.

[23] According to Hashimoto and Raisian (1985), a similar difference exists for aggregate workers, not just manufacturing workers.

[24] A major innovation introduced by Topel is in incorporating a sophisticated time-series

analysis mechanism for forecasting current and future shipments. For technical details, see Hashimoto (1990c).

[25] I do not explore the implications of the inventory parameters for generating the inventory cycle in either country. For one such study for the Japanese wool textile industry, see Trivedi (1981).

[26] The variable $\hat{q}_t$ is calculated as the difference between the current shipment and the forecasted value of the current shipment, $(q_t - \epsilon q_t)$.

[27] Because of the Almon-type restrictions of a polynomial of the third degree that I impose on the pattern of β_{ij}'s, the four-month horizon is the shortest possible horizon. Computation costs dictated that the experiment be limited to three alternative horizons.

[28] The "best" specifications turned out to be:

$$(1-\xi_1 L^3)(1-L)(1-L^{12})q_t = (1-\delta L^{12})(1-\zeta_1 L^1 - \zeta_{11}L^{11} - \zeta_{13}L^{13} - \zeta_{16}L^{16} - \zeta_{19}L^{19})u_t \quad (5a)$$

for Japan, and

$$(1-\xi_1 L^3)(1-L)(1-L^{12})q_t = (1-\delta L^{12})(1-\zeta_1 L - \zeta_{11}L^{11} - \zeta_{16}L^{16})u_t \quad (5b)$$

for the United States,

where ξ's and ζ's are coefficients. These specifications were chosen to make the series u_t to be as purely white noise as possible. Also, it can be shown readily that δ is unity for a fixed seasonality and zero for a completely nonstationary seasonality.

[29] The term *ichiji* means temporary and *kyugyosha* means those not at work.

[30] See, for example, Japan Productivity Center, *Katsuyo Rodo Tokei* (Practical Labor Statistics), 1990, 238.

[31] Another potential difficulty is that the labor supply elasticity is likely to differ between the two countries. The less elastic the labor supply, the less employment adjustment one is likely to observe. If so, an observation of a small employment adjustment may reflect an inelastic labor supply rather than the presence of firm-specific human capital. I owe this point to Todd Idson. There is an identification difficulty here. An investment in firm-specific human capital necessarily makes the labor supply inelastic at least in the short run. To the extent that this consideration is important, what may appear to be the labor supply effect is in fact the effect of firm-specific human capital.

[32] Available evidence suggests that changing the vacation schedule is an important mode of employment adjustment in Japanese manufacturing firms (Hashimoto 1990c).

[33] Also, the legal overtime premium is different between Japan and the United States. It is 25 percent above the regular pay in Japan in contrast to 50 percent in the United States. It is unlikely that hours spent investing in the employment relations after regular work hours are counted as overtime hours.

[34] I owe this point to Robert Topel.

[35] For the Japanese data, after numerous experiments with the model specification, it was found that the best specification – judged by the correlogram, Akaike's information criterion, and correlations among the estimates – still did not reduce the residuals to white noise to the same extent that it did for U.S. data.

[36] Their model uses the Almon lag specification without specifying the interrelatedness of factor demand or distinguishing between unforeseen and anticipated demand. Their independent variable is output, whereas mine is shipment.

[37] Note, however, that before 1975 hours of work in Japan evidently increased significantly in response to an increase in anticipated future demand. See table 4.8 for this result.

[38] In 1974, Japan experienced the first postwar negative growth rate, −1.3 percent. Actually the double-digit growth rate of the Japanese economy in the 1960s lasted only until about 1970. However, the slowdown in the growth rate was most dramatic after the oil shock. See Nakamura (1982, 168).

[39] I owe this hypothesis to Jacob Mincer.

[40] Akiyama et al. (1984, 12) estimated a somewhat different model from mine, and found that both employment and hours of work adjustment became more sluggish after 1976. However, they do not interpret their findings in terms of the emergence of cyclical economy in Japan after 1976.

[41] Raisian and I also used a method in which we determined E_0 for medium and large firms by multiplying its value for small firms by an equalizing premium, calculated as the percent difference in the present value of observed earnings between small firms and medium-sized or large firms. Findings were generally similar between the two approaches. See Hashimoto and Raisian (1988) for details.

5

Summary and Policy Discussions

Summary

The goal of this book has been to develop a unified understanding of some of the notable labor market differences between Japan and the United States. In Japan, as compared to the United States, for example, levels of employment tenure are high, employer-employee attachments strong, and earnings-tenure profiles steeply sloped. Moreover, industrial relations in Japan contain some unique institutions, such as joint consultation and consensus-based decisionmaking, and work organization exhibits a great deal of flexibility.

Often overlooked is the significance of the commonly observed phenomenon of Japanese employers and employees spending a great deal of informal time together after work hours.[1] In my view, this expenditure of time, at least in part, is an investment in the employment relationship, reflecting the overall greater investment in firm-specific human capital in Japan than in the United States. This investment difference results in a stronger employer-employee attachment in Japan than in the United States, as evidenced by the considerably smaller number of days lost in labor disputes in Japan. Interestingly, the two countries seem to have been diverging in this respect. The days lost in Japan started to follow a downward trend around 1960, but in the United States the trend has been moderately upwards in most of the postwar years.

The two economies also differ in the ways that employment, hours of work, and inventories adjust over the business cycle. Layoffs seem to be used much less frequently in Japan than in the United States, with adjustments in hours of work and inventories assuming a greater importance. Workforce reductions tend to be achieved with less reliance on

outright dismissals in Japan than in the United States. The difference in the mode of workforce reduction undoubtedly is a factor behind the lower unemployment rates in Japan.

Many of the modern industrial relations practices that are sometimes considered unique for Japan are not simple carryovers from the feudal era. Instead, they appear to be relatively recent innovations whose evolution has been in response to changing labor market conditions induced by rapid economic growth. The developers of these institutions—employers, employees, policymakers—were guided by the process of rational economic decisionmaking. In that process, their decisions inevitably had to take into account the constraints imposed by the transaction-cost environment. Put another way, the rapid pace of economic growth was the primary mover and shaper of the institutional changes, with culture and tradition via the transaction-cost environment serving the roles of conditioning factors.

For example, the celebrated Japanese practices of lifetime employment, seniority wages, and bonus payments all first began to appear in some form during the primary phase of industrialization in the early 1900s. Their appearance was the result of the need to stabilize the employment of skilled workers because, as the process of industrialization accelerated, acute labor shortages developed and labor turnover became high. Yet, the employment and wage systems, as we know them today, were by no means prevalent before World War II. In fact, it was not until 10 to 15 years after the end of the Second World War, with the advent of sustained rapid economic growth, that many of these features became widespread throughout the Japanese economy.

The reasons behind the labor market differences between Japan and the United States are complex. To make the investigation manageable, I began with a premise that many of the labor market differences between the two mirror the contrasts in the strength of employment relationships. Based on this premise, the theory was formulated in chapter 2 by incorporating transaction-cost considerations into human capital theory. Transaction costs in this analysis denote costs of communicating information between the employer and the employee, as well as among the employees, including the costs of convincing the other party of the

information's veracity. This approach resulted in a simple analytical framework for investigating the manner in which economic growth interacts with the transaction-cost environment in shaping labor market institutions.

An innovation in the approach is the distinction drawn between two types of investment: investment in firm-specific technical skills, and investments in the reliability of information exchanged between employer and employees, and among employees. These investments taken together constitute what is referred to as firm-specific human capital, and they help shape many of the labor market institutions and practices. Note that the human capital literature has tended to focus on technical skills, but in my view an investment in the reliability of information is just as important, if not more so, in promoting a successful production team. It is this latter type of investment that takes place in the Japanese joint consultation system, quality control circles, consensus-based decisionmaking, and time spent outside the company environs with coworkers.

The following analytical results emerge from the theory. An autonomous increase in the investment in information reliability encourages the investment in technical skills. Similarly, an autonomous increase in the investment in technical skills stimulates the investment in information reliability. I investigated how the interaction between the two types of investments affects the choice of contract type and the quality of industrial relations. For that purpose, contracts were characterized as ideal, fixed-wage, or flexible-wage. The results suggested that an increased investment in information reliability is likely to be accompanied by flexible contractual arrangements.

The theory's most significant message is that investments in both technical skills and in information reliability may be stimulated by technological change and that stimulation is greater the more elastic the cost functions underlying these investments. It was argued that the cost function associated with the investment in information reliability is more elastic in a lower transaction-cost environment. This result points to an interaction between technological progress and low transaction costs as an explanation of why the Japanese style of industrial relations

became widespread in the country after the late 1950s. A plausible interpretation of the sequence of events that took place may be as follows.

The productivity enhancement campaign (*seisansei undo*) that began with the establishment of the Japan Productivity Center in 1955, encouraged rapid economic growth. The accompanying technological progress, which began to accelerate in the early 1960s, stimulated the investment in firm-specific technical skills. The increased investment in technical skills, in turn, encouraged the investment in information reliability, and this whole process was boosted by the low-transaction-cost environment that prevailed in Japan. The increased information reliability further stimulated the investment in technical skills. The result of this process was a strengthening of the employer-employee attachment, which became manifest in such labor market institutions as joint consultations, consensus-based decisionmaking, and enterprise unions, all of which became widespread in Japan after the late 1950s.

The transaction-cost-based explanation of the Japanese industrial relations system may facilitate an understanding of how the economy coped with the two oil shocks in the 1970s. The first crisis, in late 1973, dramatically reduced the rate of economic growth in the country. During the 1970–73 period, real GNP grew at 8.1 percent per year, but the growth rate fell to a mere 0.6 percent in the 1974–75 period.[2] At the same time, Japan became plagued with an accelerated rate of inflation. The rate of increase of the consumer price index rose from 9 percent in 1972 to 25 percent in 1974. As is well-known by now, a substantial wage increase demanded by the unions after the first oil shock contributed to the decline of the economy in the 1974–75 period. Unions evidently realized that the wage-hike demand was a mistake, and no such demand was made during the second oil shock in the late 1970s. In fact, the rate of wage increase dropped from 6.4 percent in 1978 to 6.0 percent in 1979, though the rate rose slightly to 6.3 percent in 1980.[3]

The low transaction-cost environment contributed to the resilient performance of the Japanese economy during the two oil crises and afterwards. The key ingredients to the recovery were the effective cost-reducing effort, the low rate of labor disputes, productivity improve-

ments, and labor market flexibility. As Onitsuka (1988) notes, "workers did not oppose the introduction of robots and other factory-office automation because the lifetime employment scheme guaranteed them job security. Other examples of labor-management cooperation, such as the 'quality circle' and 'zero defect movements,' also tended to reduce costs and improve labor productivity . . ." (p. 21).

Finally, it is sometimes claimed that the racial and ethnic homogeneity of the Japanese population fosters harmonious industrial relations in that country. To the extent that population homogeneity leads to low transaction costs, this claim may have some validity. As will be noted later, however, it is not the population homogeneity *per se* that lowers transaction costs. Rather, the critical factors are homogeneity in the attitude toward work, the willingness to learn new skills, and the spirit of cooperation.

The theory developed in chapter 2 is not designed to yield explicit relationships among variables, with identifiable parameters that can be estimated. Instead, its purpose is to generate qualitative propositions and provide a framework to help develop a unified understanding of the various labor market institutions. In addition, transaction costs are not observable, so it is not possible to test directly the proposition that transaction costs are lower in Japan than in the United States. Instead, one must rely on indirect evidence. A skeptical reader may be inclined to discredit any such evidence put forth to support the theory. Faced with this prospect, it would be tempting to begin by asserting that transaction costs are lower in Japan than in the United States and then investigate the implications of such an assertion.

Although such an approach is defensible, an even simpler approach would be to start by asserting that the investment in firm-specific human capital is greater in Japan than in the United States. This approach could yield a unified understanding of the differences between the two countries in the shape of the earnings profile, wage flexibility, and labor turnover. In asking *why* Japanese investment in firm-specific human capital is greater and transaction cost lower, however, one may gain additional insights. For this reason, chapters 3 and 4 examine the influences that may bear on transaction costs, focusing on the factors

that may help explain the difference in firm-specific human capital investment between the two countries.

In constructing a satisfactory test of any theory, one must ask what phenomena will be observed if the theory is to be refuted. To this end, the quit-dismissal distinction was investigated in chapter 4. Although the underlying data have some problems, I found the evidence by and large to support the theory. In particular, the prediction examined is that the quit-dismissal distinction in Japan is less closely related to economic conditions than it is in the United States. One would expect that in Japan, where transaction costs are hypothesized to be low, it would be unclear as to which party initiated separations in a large proportion of cases. As a result, one would expect the reported distinction in the Japanese data to tend to be arbitrary and independent of economic conditions.

In the United States, where transaction costs are hypothesized to be high, the employer and employee would make their own separation decisions in response to exogenous changes in labor demand. The resulting separations would be reported either as layoffs or quits, depending on which party made the decision. Based on these considerations, one would expect the reported distinction between the two separation categories to be more random and less related to economic conditions in Japan than in the United States. The regression analysis indicates that the quit-layoff distinction in manufacturing is statistically significant for the United States, but ambiguous for Japan, thus confirming the prediction based on the transaction-cost argument.

Needless to say, it would be useful to have more direct evidence on the magnitude of transaction costs in both countries. However, these costs are difficult, if not impossible, to measure directly, and one probably would have to rely on anecdotal evidence like the example in chapter 3 of the compliant Japanese worker in contrast to the resistant American worker. Much more evidence along this line is needed, however, before one could hope to fully document the transaction-cost differences. Also discussed were some of the institutions in Japanese industrial relations which, along with traditional and cultural factors, point to the existence of low transaction costs in Japan. It is hoped that these discussions help clarify my perspective in this study.

Policy Discussions and Suggestions for Future Research

Turning to the policy implications of this study for the United States, let me focus on the relationship between the employment system and the overall economic performance. This focus is appropriate, as the international competitiveness of the American economy is a critical policy concern for the United States. The key ingredients for an internationally competitive economy are the abilities of its labor force to adapt flexibly in an environment of continual innovation and to produce quality products in a cost-effective manner. These abilities, I argue, are fostered by investment in the employment relationship, and they seem to characterize Japan's labor force. What lessons can one learn from the Japanese experience?

Since labor is the predominant input to production in the U.S. economy, an improvement in labor performance would seem to be a most direct way to deal with the sluggish productivity growth of that economy. Besides, such an improvement would in turn stimulate investments in technology and physical capital. Note that the emphasis of this study contrasts with that of Jorgenson et al. (1987), as discussed in chapter 3, who argue that Japan's high rates of growth in capital and intermediate inputs were largely responsible for the rapid growth in Japan's output between 1960 and 1979. Growth in physical capital undoubtedly played a role in Japan's postwar economic performance, but this study emphasizes the importance of investments in industrial relations systems in making the machines run efficiently.[4]

Labor productivity is realized at the firm level. Activities in a firm involve teamwork among its employees, as well as between the employer and the employees. The teamwork is supported by the firm's industrial relations system. Therefore, the industrial relations system critically influences the performance of workers in the firm. The effectiveness of that system, in turn, depends on the quantity and quality of investments made to maintain and improve it. The postwar Japanese experience seems to indicate that such investments help foster a strong sense of identification with and commitment to the company on the part

of both the management and the worker. Cole (1979) summarized the Japanese industrial relations system this way:

> At the heart of the distinctiveness of the Japanese approach is the attempt to maximize the harmonization of individual and organizational goals. Most of the key postwar personnel innovations can be understood in this light. Moreover, this attempt is made not only by providing incentives for workers to adopt management-defined organizational goals, but also by attempting to maximize the achievement of worker-defined goals so long as they do not conflict with high priority management goals (p. 253).

As discussed earlier, I have distinguished two kinds of investments for improving an industrial relations system: investments in technical skills and investments in information reliability. Japanese workers are trained not only in technical skills, but also in the skills they need to be effective team members, skills which promote information reliability. To maintain these skills, Japanese firms continuously train and retrain workers as required within their own organizations, and utilize skills in a flexible manner within their own or subsidiary organizations (see chapter 4). These practices constitute the central features of the Japanese private sector training, which has played a key role in human resource development for Japan's modern industry. In contrast, training in U.S. firms tends to focus on narrowly defined skills, and becoming effective team members has not been its main objective.[5]

Private sector training was also instrumental in the development of a skilled workforce in the United States; thus, at first, the Japanese experience would seem to parallel the American experience. There are notable differences, however, between the two. Japan has relied primarily on firm-level strategy rather than on government programs, public vocational schools, and training institutions for the promotion of private sector training. Japanese workers develop and accumulate skills useful in the specific firms in which they are employed rather than in the economy at large.

Laws and public policies have played important roles, while often leaving much room for private sector decisionmaking. Japanese public

policies on training have focused on ensuring the availability of educated and trainable new workers to all industries, leaving the provision of industrial training up to the individual firms.[6] The foundation for the Japanese training strategy has been the educational system, which focuses on basic education and serves primarily to guide students to a sector of the economy rather than to specific tasks. Once employed, Japanese workers build on their solid basic education by acquiring firm-specific training. As a result, vocational and professional schools have been less common in Japan than in the United States. Training that American workers receive at vocational and professional schools is not firm-specific. As a result, these workers can change their place of employment without a loss of their earning power.

The cornerstone of Japanese private sector training is the employee rotation system, whereby an employee is rotated among different tasks on a regular basis. This practice fosters the formation of intrafirm general, though firm-specific, skills. Since these skills are useful in many divisions within the company, a decline in demand in one division does not necessarily lead to layoffs of affected workers. The resulting job security encourages employees to acquire firm-specific skills and welcome new technologies, and strengthens the employer-employee attachment.

In addition, joint consultation promotes the harmonization of individual and organizational goals. The resulting bond between employees and their firm again increases the incentive to invest in firm-specific skills. This way, Japanese training practices contribute to the decrease in the job turnover of skilled workers. The open labor markets that exist are limited to older workers, farm workers who migrate to the cities on off-seasons, or unskilled and part-time workers, many of whom serve as buffers to the lifetime employees. In contrast, the U.S. approach to training has contributed to the high mobility of skilled workers among firms, and even among industries and occupations.

The Japanese training practice has had an obvious payoff in terms of the high quality of manufactured products. The connection between training and product quality has an obvious implication for the international competitiveness of firms' products, as evidenced by the stream of

successful Japanese products in recent years. The importance of promoting high product quality is most visible in the operation of the celebrated just-in-time, or *kanban*, system.[7] The successful operation of the *kanban* system depends critically on the continuous flow of zero-defect parts and components. The supply of highly reliable components is assured when workers are trained and motivated to produce them. Such training and the nurturing of motivation seemingly rank very highly in the Japanese industrial relations system.

Are some of the Japanese practices importable to the United States? The analysis in chapter 2 suggests that many of the practices were endogenously determined, having evolved in response to the needs generated by rapid economic growth and as a reflection of Japan's cultural values and tastes. Merely copying Japan's endogenously determined institutions and practices, therefore, will not necessarily prove successful in the United States. Cultural values and tastes are among the exogenous variables which shape the cost function underlying the investment in information reliability. The key to a successful adaptation of the Japanese practices, therefore, is to ascertain how American exogenous variables differ from those of the Japanese and determine how they may be manipulated to bring about the desired outcomes. The question, therefore, is how to fashion an industrial relations system in the United States that would achieve results similar to those of the Japanese industrial relations system, but be conditioned by American cultural and traditional values.

Consider, for example, the frequently asked question, "Would greater wage and labor market flexibility raise productivity?" Our theory suggests that this question is posed incorrectly. Wage flexibility, for example, is endogenous, and it doesn't make sense to ask if imposing greater flexibility would improve productivity. Costs of investments in the employment relationship – investments in technical skills and information reliability – are the exogenous variables. What this study shows is that a low transaction-cost environment for these investments promotes labor market flexibility and productivity. If an economy is in a high transaction-cost environment, a flexible-wage contract may not be efficient, and forcing such a contract onto this economy will lower output.

Another example relates to worker participation in decisionmaking. There is evidence indicating that, on balance, some forms of worker participation have helped increase productivity in American firms.[8] The question remains unanswered, however, as to what type of participation under what conditions is most likely to be effective. Here again, such forms of participation as joint consultation, quality control circles, and consensus-based decisionmaking are endogenous phenomena. They may have worked relatively well in Japan, but there is no guarantee that they will be equally effective in all American firms. Imposing worker participation in a high transaction-cost environment is likely to result in friction and conflict that waste time and other resources for everyone involved.

It is clear, therefore, that a rush to borrow the "Japanese system" in the United States or elsewhere will not always be successful. Robert Hayes (1981) describes the American tendency for rushing-to-borrow in the late 1970s as follows:

> ...U.S. businesses found themselves increasingly displaced in international markets and, more recently, in their home markets as well. This sudden weakness has come as a shock to many American managers who, in searching belatedly for causes and explanations, have often looked for dramatic, easily imitated or purchased solutions: quality circles, government assistance, and the use of intelligent robots.... There are no magic formulas—just steady progress in small steps and focusing attention on manufacturing fundamentals. This is why their [Japanese] example will be so hard for American companies—and American managers—to emulate (p. 65).

Not surprisingly, therefore, attempts to adopt quality control circles in the United States appear to have met with mixed results.[9] The data could not be found that would indicate the exact extent of success with QC circles in the country, but the available literature suggests that they have not always been successful.[10] To be sure, QC circles in Japan haven't always been successful either, but it seems safe to infer from the literature that the probability of success has been higher in Japan than in

the United States. The strong attitude of individualism, distrust between employees and management, management's failure to involve unions in setting up QC circles, middle management's fear of being bypassed in decisionmaking processes, all are said to have contributed to the failure of QC circles in some American firms.

This book has argued that Japan's low transaction-cost environment was the key factor in the successful implementation of many of the Japanese-style practices. It is also asserted that racial and ethnic homogeneity, as well as cultural and traditional influences, have contributed to this environment. It doesn't follow, however, that there is no possibility of creating a similar environment in the United States. To the contrary, the experiences at some of the Japanese transplant companies suggest that it is possible to do so. In particular, the experiences at NUMMI (New United Motor Manufacturing), Honda of America Manufacturing, Diamond-Star Motors, Subaru-Isuzu Automotive do suggest that the productivity of American workers can be boosted if an effort is made to create a low transaction-cost environment.[11]

A major thrust at these and other operations has been to develop a sense of teamwork by involving workers in decisionmaking and by improving employer-employee relations.[12] Most have also adopted an elaborate screening of job applicants. My investigation of some of the Japanese automobile transplants makes it clear that they have devoted, at least initially, far more resources to screening and assessing employees than their parent companies do.[13] The large expenditure of resources in these activities is understandable given the Japanese firms' desire to assemble homogeneous workforces from the highly varied American labor force. In the case of Diamond-Star Motors and Subaru-Isuzu Automotive, their respective state employment agencies performed initial screenings before the surviving applicants were put through company assessment procedures. To approximate the Japanese workforce characteristics, these transplants hired consulting firms to develop their assessment procedures. Representatives of a consulting firm retained by Diamond-Star Motors spent about a month and a half in Japan observing Japanese worker characteristics, and subsequently developed procedures to identify key characteristics in American applicants that

would be conducive to implementing the Japanese approaches to training and labor relations. Assessment procedures usually involve a multistep testing of the applicant's general ability, the ability to work effectively with others, problemsolving skills, manual dexterity, diligence, and other qualities. A Japanese manager at Diamond-Star Motors indicated that one of the key qualities that the Japanese parent company, Mitsubishi Motors, looked for was the willingness to accept flexible job assignments. The process is evidently quite selective. Only about 10 percent survived the screening and the assessment procedures at Diamond-Star Motors and Subaru-Isuzu Automotive, which also employed a consulting firm to develop its assessment procedure. Some U.S. workers who were hired at Honda, Ohio, reportedly were surprised at being asked numerous questions seemingly unrelated to work, as well as at the long duration of their interviews, which were attended by company executives and vice presidents.[14] As noted in chapter 2, careful screening of job applicants is a device for creating an environment of low transaction costs on the shop floor.

Once hired, these workers reported attending frequent meetings with management concerning production matters. These meetings are an important part of training.[15] The frequency of such meetings at the Honda plant in Ohio is indicated by the new slogan, "let's *Y-gaya*," which means in fractured Japanese, "let's have a bull-session."[16] In the Japanese transplants, the management and workers share the same table for lunch, thereby creating an informal setting for reliable information exchange. This way, workers on the shop floor hopefully develop an increased sense of participation in the firm's decisionmaking process. It is noteworthy also that layoffs and dismissals have been rare in these operations.

Productivity at NUMMI after only one year of operation was reported to have increased by 48.5 percent over what it was at the old Fremont plant under General Motors (GM) management.[17] Absenteeism and drug use, which had plagued the plant, dropped dramatically after NUMMI took over.[18] NUMMI's efforts at productivity enhancement continue with the slogan "let's *kaizen*," or "let's improve."[19] Also, in contrast to the old Fremont plant, the quality of the automobiles

produced at NUMMI has been highly rated.[20] What little evidence there is on productivity at NUMMI indicates that, in the first year of operation, NUMMI ranked in productivity somewhere between the Fremont plant and a Toyota plant in Japan.[21]

Honda's operation in Ohio is another interesting example. Honda in Japan is known for its emphasis on nurturing the sense of teamwork among its workers. This emphasis was imported to the Ohio operation. At the Ohio plant, employees, referred to as associates, are encouraged to acquire skills and training by continually interacting with one another on the shop floor rather than through formal training sessions.[22] Clearly, such learning by interaction is more effective the lower the transaction costs among co-workers. A lowering of transaction costs is achieved, in turn, by an elaborate screening of new hires mentioned earlier. Productivity at the plant reportedly approaches that of Honda's plants in Japan, and the quality of the automobiles produced in Ohio is said to equal that of Japanese-made Hondas.

This and other newly emerging evidence suggest that some of the practices of Japanese industrial relations may be imported successfully.[23] It is too early to tell, however, what the effective way to do so is. Also, while the screening of job applicants initially was quite intensive in these transplants, the intensity appears to have lessened for subsequent hiring. A question arises as to how these firms will maintain a low transaction-cost environment as their workforce compositions change with turnover. As is clear by now, a low transaction-cost environment encourages investments in the employment relationship. The resulting long-term commitment to and identification with the employment relationship promote productive behaviors. It is only after a low transaction-cost environment is created that firms can achieve "harmony" between the goals of the worker and the goals of the organization.

Interestingly, these considerations suggest an agenda for future research on the use of subcontractors. Japanese manufacturers are said to use subcontracting to a greater extent than their American counterparts—Japanese firms are less vertically integrated than U.S. firms. A hypothesis worth investigating is that Japanese firms have opted to lower transaction costs on the shop floor by limiting the scope of operations

within the firm. One way of limiting the scope of operations is to rely on subcontractors to perform some of the production activities.[24]

As a strategy to create low transaction-cost environments, most of the Japanese transplants have chosen to locate near rural towns in the Midwest and Canada, where the available workforce is more homogeneous than in urban areas. They have also shied away from hiring workers with previous experience in automobile industries, choosing instead to train young workers and workers with little industrial experience. They have employed extensive screening of job applicants. As noted earlier, Japanese transplants have taken steps to instill in the workers a sense of participation in the decisionmaking process by creating informal settings in which to hold frequent discussions with co-workers and supervisors alike.

An effort to emulate the Japanese workplace cannot proceed without regard to other social goals, however. For example, an attempt to homogenize the workforce may conflict with the laws and policies for promoting equal employment opportunities. In fact, Honda in Ohio ended up facing a job discrimination charge brought about by the U.S. Equal Employment Opportunity Commission.[25] Racial and ethnic homogeneity are not the necessary condition for lowering transaction costs. What is needed is to "homogenize" the workforce in certain characteristics that are the keys to creating a low transaction-cost environment, such as pride in producing quality products, willingness to learn new skills, and a spirit of cooperation with co-workers (as opposed to homogeneity strictly along racial and ethnic lines). Such an approach is unlikely to run afoul of the equal employment goal. Public policies on education obviously have some role to play in instilling these characteristics in the future workforce.

Clearly, borrowing Japanese practices must be done in a very selective way in order to fit American needs and circumstances. That is exactly what the Japanese have done – borrow from the United States and Western Europe to fit Japanese needs and circumstances – in modernizing their economy after the Meiji Restoration of 1868, and during the critical postwar years with the productivity enhancement campaign.

Finally, the role of economic growth must not be overlooked. In

particular, recall the earlier argument that the rapid pace of economic growth and the accompanying technological change were the prime movers in developing many of the successful Japanese industrial relations practices. As discussed in chapter 2, an outlook for sustained economic growth stimulates the incentive to invest in human capital just as it encourages the investments in physical capital. An important goal of macroeconomic policies is to generate such an outlook. Thus, the present study has revealed a link between macroeconomic policies and the goal of increasing worker performance, a link that has not been stressed in policy discussions.

Let me end this book with a discussion on future research. It would be illuminating to evaluate the applicability of the Japanese training and labor relations approaches to the U.S. labor force by studying the Japanese transplants in the United States. The preceding discussions suggest that the Japanese automobile transplants may be of particular interest. One of them, the Honda Motor Company of Ohio, is now exporting automobiles to Japan, and others will soon follow suit. These companies appear poised, therefore, to demonstrate the feasibility of importing Japanese employment practices to the United States. How are these transplants succeeding in implementing their parent companies' employment practices in the different environment of the American labor force and employment practices? What modifications are necessary in these practices to ensure their success in U.S. firms? What characteristics of the American labor force are likely to enhance the effectiveness of Japanese practices in the United States?

In trying to answer these questions, I would propose the following hypotheses: (A) transplants invest more in screening new hires than their parent companies do, given the heterogeneity of the American labor force; (B) transplants invest less in the employment relationship than their parent companies do because of the high investment costs and high propensity for mobility associated with U.S. workers; and (C) in trying to import their parent companies' practices, these transplants must have taken steps to adjust to the characteristics of the American labor force and labor market practices.

Some of the issues, then, that must be clarified include the following:

1. To what extent are these firms succeeding in adapting their Japanese approaches to new-employee screening, employee training, employee rotation, joint consultation, the *kanban* system, quality control circles, the compensation system (do they give as substantial bonus payments as their parent companies do?), and the employment system (given that layoffs are rarely used, how do they utilize workers when demand is low?).

2. What steps are being taken to deal with such features of the U.S. labor force as the high propensity for mobility, the heterogeneity, the level of basic skills, and attitudes toward work?

3. To what extent is the trainability of U.S. workers a factor in selecting a site?

4. How much time and money are spent on screening and training new employees?

5. What are employees' perceptions of the manner in which the Japanese approach affects their motivation and productivity?

6. Which characteristics of U.S. labor practices might enhance the effectiveness of Japanese practices when applied to the American labor force?

7. What aspects of the Japanese practices would be counterproductive if adopted without modification in the United States?

As noted earlier, I have begun an investigation along the lines discussed above.

NOTES

[1] This phenomenon implies that the conventionally measured hourly productivity is overstated for Japanese workers. I calculated elsewhere that taking into account the extra hours that Japanese workers spend with one another after work increases the average Japanese hours of work by 10.4 percent and that this increase, in turn, implies a widening of the productivity gap between Japan and the United States to somewhere between 58 and 67 percent in favor of the United States. See Hashimoto (1990a). Such a calculation, however, must be interpreted with caution. In particular, it is inappropriate to conclude that Japanese workers are low productivity workers. There is obviously the issue of how to measure productivity. Clearly, the time expenditure by Japanese workers has paid off in terms of their increased competitiveness in international markets. What is not clear is whether Japanese workers have been over-investing their time.

[2] The factual discussion on this experience draws heavily on Onitsuka (1988), which contains

an informative discussion on the macroeconomic performance of the Japanese economy during the oil crisis.

[3] Also at work was the expansion of the money supply. The first oil shock took place against the background of the easy-money policy that preceded it, but when the second oil shock arrived policymakers responded swiftly with anti-inflationary measures. See Onitsuka (1988).

[4] It is interesting to recall the observation by Hayes (1981) that Japanese machines are not that much newer than those in the U.S., but that they just run newer.

[5] The cross-training practice at Japanese automobile transplants appears to have created some problems for American workers who came in with specific skills. For example, tool and die makers at the Mazda plant in Flat Rock, Michigan reportedly were insulted by the requirement that they learn lesser jobs, such as operating a crane (Fucini and Fucini 1990, 92-93).

[6] See Levine and Kawada (1980) for an informative discussion on the role of industrial training in Japanese economic development.

[7] As noted in chapter 3 (note 66), the *kanban* system was pioneered by the Toyota Motor Company in the 1950s, and became widely adopted by other Japanese manufacturers after the late 1970s. Under this system, materials, parts, and components are produced and delivered only when they are needed.

[8] Levine and Tyson (1990) found that of the 29 studies found in the literature only two concluded that participation hurts productivity. Fourteen studies found that participation increases productivity and the remaining 13 were inconclusive.

[9] See chapter 3 for a discussion on quality control circles in Japan. The first quality control circle in the United States was implemented in 1974 at Lockheed Missile and Space Company, with subsequent success. Quality circles grew rapidly afterwards, and as of the early 1980s there were over 3,000 circles in American firms (Blair and Ramsing 1983). See Cole (1979, 1980) for a list of U.S. firms adopting quality control circles, as well as a discussion of their motives.

[10] See, for example, Blair and Ramsing (1983). Drucker (1990) argues that many QC circles failed in American plants because they were established without statistical quality control, the main benefit of which is to provide rigorous and reliable feedback between production and workers involved.

[11] To be sure, such a suggestion must be interpreted with caution, since it is unclear if the successful experiences so far will survive the test of time. NUMMI was established in 1984 as a joint venture between General Motors (GM) and Toyota. Honda of America Manufacturing in Marysville, Ohio started production in 1978. Diamond Star Motors is a joint venture between Mitsubishi and Chrysler, and production started in 1988. Its plant in Normal, Illinois with over 470 robots is said to be the world's most technologically advanced. (See "Shaking Up Detroit," *Business Week*, 14 August 1989.) Subaru-Isuzu Automotive in Lafayette, Indiana began production in 1989. As NUMMI inherited the old Fremont plant operated by GM and employed many of the former GM workers, its experience seems particularly useful for ascertaining the effects of Japanese-style operations in the United States.

[12] In the ensuing discussion, I rely on the informative book by Shimada (1988), as well as on my own research in progress, for the facts regarding the U.S. operations of Japanese automobile manufacturers.

[13] A Japanese manager at Subaru-Isuzu Automotive stated that if their parent companies in Japan were to engage in such extensive screening and assessing, they would quickly lose their applicants to other firms.

[14] See "How Does Japan Inc. Pick Its American Workers?", *Business Week*, 3 October 1988, for

similar evidence on the intensive screening at Mazda Motor Mfg. in Michigan as well as at Diamond-Star Motors. According to a survey of 83 Japanese transplants and 41 U.S. manufacturing plants, in 1985 a Japanese transplant spent an average of $759, and an American plant $411, to hire a new worker (Higuchi 1987). These figures do not include the value of time spent on recruitment.

[15] Based on the same survey mentioned in note 14, Higuchi (1987) reports that in 1985 Japanese transplants spent an average of $967, and American automobile manufacturers, an average of $306, to train a new hire. These figures are only indicative as they do not include the value of time of trainers and trainees.

[16] The term *Y-gaya* evidently was invented at Honda. It is made up from the Japanese onomatopoeia *wai-wai* and *gaya-gaya* which convey the noise level in a typical "bull session."

[17] What is noteworthy is the fact that the productivity improvement occurred in spite of the fact that the plant and equipment were largely inherited from the old Fremont operation and that many of the workers were the same as those who worked at that plant. (See Shimada 1988, 32.)

[18] The absenteeism at the old GM plant was reported to be 20 percent, but it now stands at 2 percent. See "Shaking Up Detroit," *Business Week*, 14 August 1989.

[19] *Kaizen* also underlies the approaches at Honda, Diamond-Star, Subaru-Isuzu as well as at Mazda in Flat Rock, Michigan. See "How Does Japan Inc. Pick Its American Workers?", *Business Week*, 3 October 1988.

[20] According to Shimada (1988, 42), *Consumer Reports* in 1986 rated the Novas produced at NUMMI somewhere between 3.6 and 3.8 out of the maximum attainable of 5.0, while other American-made automobiles averaged 2.0 to 3.0.

[21] In terms of hours of labor, including production and nonproduction workers, it took 29.1 hours at the GM Fremont plant (1978), 19.6 hours at NUMMI (1986), and 18.0 hours at a Toyota plant in Japan to produce an automobile (Shimada 1988, table 1). This type of comparison obviously must be interpreted with caution, because, for example, automobile models differ among plants.

[22] In Honda's Associate Development Center, located adjacent to the main automobile plant in Marysville, there are seven classrooms and additional instruction facilities, some with computer equipment and others with laboratories attached (to teach welding techniques, for example).

[23] The recent failure of the United Auto Workers (UAW) to organize Nissan workers at its Tennessee plant is another indication that some Japanese practices can work successfully in the United States. Had these practices not been working well at Nissan, one would have expected a much stronger support for unionization than was realized at the election. (The UAW bid was defeated solidly by more than a 2-1 margin.) The only issue that the UAW could find to rally pro-union sentiment was the alleged lack of safety associated with the rapid pace of work. Evidently, however, it was not a convincing issue to the workers at large. Several years earlier, the UAW also tried to organize the Honda plant in Ohio, but withdrew its effort and an election was never held. It should be noted that both Diamond-Star Motors and Mazda Motor Manufacturing are UAW-organized. The fact that they are both joint ventures – with Chrysler and Ford, respectively – obviously is the main reason for their unionization. Mazda's experience with its UAW workforce has been turbulent, according to Fucini and Fucini (1990). Diamond-Star doesn't appear to have experienced major problems with its union, perhaps because its workforce, unlike the one at Mazda, consists largely of those with nonautomotive backgrounds.

[24] See Aoki (1990) for discussions on the Japanese firms and their use of subsidiaries and outside suppliers.

[25] Honda was accused of giving high preference in hiring to workers from the Marysville area to the exclusion of the more racially mixed labor pool available in Columbus. It paid $6 million to about 370 blacks and women to settle the case.

REFERENCES

Abegglen, James. 1958. *The Japanese Factory*. Glencoe, IL: Free Press.

Abegglen, James, and George Stalk, Jr. 1985. *Kaisha: The Japanese Corporation*. New York: Basic Books.

Abraham, Katharine G., and Susan N. Houseman. 1989. "Job Security and Work Force Adjustment: How Different are U.S. and Japanese Practices?" NBER Working Paper No. 3155.

Abraham, Katharine G., and Lawrence F. Katz. 1986. "Cyclical Unemployment: Sectoral Shifts or Aggregate Disturbances?" *Journal of Political Economy* 94: 507-522.

Akerlof, George, and Hajime Miyazaki. 1980. "The Implicit Contract Theory Meets the Wage Bill Argument." *Review of Economic Studies* 47: 321-338.

Akiyama, Taro, Masahiro Okuno, and Kiminori Matsuyama. 1984. "Zaiko Hendo To Koyo Chosei (Inventory Fluctuations and Employment Adjustments)." Financial Analysis Division of the Bank of Japan.

Antel, John J. 1985. "Costly Employment Contract Renegotiation and Labor Mobility of Young Men." *American Economic Review* 75:976-991.

Aoki, Masahiko. 1983. "Aspects of the Japanese Firm." In *The Economic Analysis of the Japanese Firm*, ed. Masahiko Aoki, 3-43. Amsterdam: North-Holland.

_____ . 1988. *Information, Incentives, and Bargaining in the Japanese Economy*. New York: Cambridge University Press.

_____ . 1989. "The Nature of the Japanese Firm as a Nexus of Employment and Financial Contracts: An Overview." *Journal of the Japanese and International Economies* 3: 333-366.

_____ . 1990. "Towards an Economic Model of the Japanese Firm." *Journal of Economic Literature* 28: 1-27.

Azariadis, Costas. 1975. "Implicit Contracts and Underemployment Equilibria." *Journal of Political Economy* 83: 1183-1202.

Baily, Martin N. 1974. "Wages and Employment Under Uncertain Demand." *Review of Economics and Statistics* 41: 37-50.

_____ . 1977. "On the Theory of Layoffs and Unemployment." *Econometrica* 45: 1043-1063.

Barzel, Yoram. 1989. *Economic Analysis of Property Rights*. New York: Cambridge University Press.

Becker, Gary S. 1962. "Investment in Human Capital: A Theoretical Analysis." *Journal of Political Economy* 70 (Supplement): 9-49.

_____ . 1975. *Human Capital* (2nd edition). New York: National Bureau of Economic Research.

Bils, Mark. 1985. "Real Wages over the Business Cycle: Evidence from Panel Data." *Journal of Political Economy* 93: 666-89.

Blair, John D., and Kenneth D. Ramsing. 1983. "Quality Circles and Production/Operations Management: Concerns and Caveats." *Journal of Operations Management* 4: 489-497.

Blinder, Alan S. 1976. "On Dogmatism in Human Capital Theory." *Journal of Human Resources* 11 (Winter): 8-22.

_____, ed. 1990. *Paying for Productivity: A Look at the Evidence*. Washington DC: Brookings Institution.

Carmichael, Lorne. 1983a. "Firm-Specific Human Capital and Promotion Ladders." *The Bell Journal of Economics* 14 (Spring): 251-58.

_____. 1983b. "Does Rising Productivity Explain Seniority Rules for Layoffs?" *American Economic Review* 73: 1127-1131.

Cheung, Steven N.S. 1969. "Transaction Costs, Risk Aversion, and the Choice of Contractual Arrangements." *Journal of Law and Economics* 12: 23-45.

Chinloy, Peter and Ernst Stromsdorfer. 1987. *Labor Market Adjustments in the Pacific Basin*. Boston: Kluwer-Nijhoff.

Cole, Robert E. 1979. *Work, Mobility, and Participation*. Berkeley: University of California Press.

_____. 1980. "Learning from the Japanese: Prospects and Pitfalls." *Management Review* 69: 22-42.

De Vos, George, and Hiroshi Wagatsuma. 1973. "The Entrepreneurial Mentality of Low-Class Urban Japanese in Manufacturing Industries." In *Socialization for Achievement: Essays in the Cultural Psychology of the Japanese*, ed. George De Vos, 201-19. Berkeley: University of California Press.

Dore, Ronald. 1962. "Sociology in Japan." *British Journal of Sociology* 13: 116-23.

_____. 1973. *British Factory-Japanese Factory: The Origins of National Diversity in Industrial Relations*. Berkeley: University of California Press.

Drucker, Peter F. 1990. "The Emerging Theory of Manufacturing." *Harvard University Press* (May-June): 94-102.

Edwards, Linda N. 1988. "Equal Employment Opportunity in Japan: A View from the West." *Industrial and Labor Relations Review* 41: 240-250.

Ellenberger, James N. 1982. "Japanese Management: Myths or Magic." *The AFL-CIO American Federationist* (April-June): 3-12.

Freeman, Richard B. 1987. "Labor Market Institutions, Constraints, and Performance." National Bureau of Economic Research. Mimeo.

_____. 1989. "Business Labor Relations Goals and Practices Across OECD Countries." Paper presented at the Japan MITI Conference on Corporate Management and Labor Markets: Implications for International Competitiveness, January 1989.

Freeman, Richard B., and Martin L. Weitzman. 1987. "Bonuses and Employment in Japan." *Journal of the Japanese and International Economies* 1: 168-194.

Fruin, W. Mark. 1983. *Kikkoman: Company, Clan, Community*. Cambridge: Harvard University Press.

Fucini, Joseph J., and Suzy Fucini. 1990. *Working for the Japanese: Inside Mazda's American Auto Plant*. New York: Free Press.

Garon, Sheldon. 1987. *The State and Labor in Modern Japan*. Berkeley: University of California Press.

Gordon, Andrew. 1985. *The Evolution of Labor Relations in Japan: Heavy Industry, 1853-1955*. Cambridge: Harvard University Press.

Gordon, Donald F. 1974. "A Neo-Classical Theory of Keynesian Unemployment." *Economic Inquiry* 12: 431-459.

Gordon, Robert J. 1982. "Why U.S. Wage and Employment Behavior Differs from that in Britain and Japan." *Economic Journal* 92: 13-44.

Hall, Robert E. 1982. "The Importance of Lifetime Jobs in the U.S. Economy." *American Economic Review* 72 (September): 716-24.

Hall, Robert E., and Edward P. Lazear. 1984. "The Excess Sensitivity of Layoffs and Quits to Demand." *Journal of Labor Economics* 2: 233-257.

Hall, Robert E., and David M. Lilien. 1979. "Efficient Wage Bargains Under Uncertain Supply and Demand." *American Economic Review* 69: 868-879.

Hamada, Koichi, and Yoshio Kurosaka. 1984. "The Relationship Between Production and Unemployment in Japan." *European Economic Review* 25: 71-94.

_____. 1986. "Trends in Unemployment, Wages and Productivity: The Case of Japan." *Economica* 53 (Supplement): S275-S296.

Hamilton, Gary G., and Nicole Woolsey Biggart. 1988. "Market, Culture, and Authority: A Comparative Analysis of Management and Organization in the Far East." *American Journal of Sociology* 94 (Supplement): S52-S94.

Hanami, Tadashi. 1981. *Labor Relations in Japan Today.* Tokyo: Kodansha International.

_____. 1984. "Conflict Resolution in Industrial Relations." In *Industrial Conflict Resolution in Market Economies*, ed. Tadashi Hanami and Roger Blanpain. Antwerp: Kluwer Law and Taxation Publishers.

Hanami, Tadashi, and Roger Blanpain, eds. 1984. *Industrial Conflict Resolution in Market Economies.* Antwerp: Kluwer Law and Taxation Publishers.

Hart, Robert A. 1984. *The Economics of Non-Wage Labor Costs.* London: Allen & Unwin.

Hart, Robert A., ed. 1988. *Employment, Unemployment and Labor Utilization.* London: Unwin-Hyman.

Hashimoto, Masanori. 1975. "Wage Reduction, Unemployment and Specific Human Capital." *Economic Inquiry* 13: 485-504.

_____. 1979. "Bonus Payments, On-the-Job Training and Lifetime Employment in Japan." *Journal of Political Economy* 87: 1086-1104.

_____. 1981. "Firm-Specific Human Capital as a Shared Investment." *American Economic Review* 71: 475-82.

_____. 1985. "Firm-Specific Human Capital: Rejoinder to Professor Ohashi." *International Economic Review* 26: 753-754.

_____. 1990a. "Employment and Wage Systems in Japan and Their Implications for Productivity." In *Paying for Productivity: A Look at the Evidence*, ed. Alan S. Blinder. Washington DC.: Brookings Institution.

_____. 1990b. "A Theory of the Employment System in Japan." The Ohio State University. Mimeo.

_____. 1990c. "Three Aspects of Employment and Unemployment in Japan: A Contrast with the United States." The Ohio State University. Mimeo.

Hashimoto, Masanori, and John Raisian. 1985. "Employment Tenure and Earnings Profiles in Japan and the United States." *American Economic Review* 75: 721-735.

_____ . 1987a. "Wage Flexibility in the United States and Japan." In *Labor Market Adjustments in the Pacific Basin*, ed. Peter Chinloy and Ernst Stromsdorfer. Boston: Kluwer-Nijhoff.

_____ . 1987b. "Aspects of Labor Market Flexibility in Japan and the United States." Revision of a paper presented at the International Symposium on Employment Security and Labor Market Flexibility, Yokohama National University.

_____ . 1988. "The Structure and Short-Run Adaptability of Labor Markets in Japan and the United States." In *Employment, Unemployment and Labor Utilization*, ed. Robert Hart. London: Unwin-Hyman.

_____ . 1989. "Investments in Employer-Employee Attachments by Japanese and U.S. Workers in Firms of Varying Size." *Journal of the Japanese and International Economies* 3: 31-48.

Hashimoto, Masanori, and Ben T. Yu. 1980. "Specific Capital, Employment Contracts and Wage Rigidity." *The Bell Journal of Economics* 11: 536-49.

Hayes, Robert H. 1981. "Why Japanese Factories Work." *Harvard Business Review* 59: 56-66.

Higuchi, Yoshio. 1987. "A Comparative Study of Japanese Plants Operating in the U.S. and American Plants: Recruitment, Job Training, Wage Structure, and Job Separation." Columbia University. Mimeo.

Hill, Anne. 1983. "Female Labor Supply in Japan: Implications of the Informal Sector for Labor Force Participation and Hours of Work." Unpublished working paper.

Hulten, Charles R., ed. 1990. *Productivity Growth in Japan and the United States*. National Bureau of Economic Research Conference on Income and Wealth. Chicago: University of Chicago Press, forthcoming.

Idson, Todd L. 1989. "Establishment Size Differentials in Internal Mobility." *The Review of Economics and Statistics* 121: 721-724.

Ito, Takatoshi. 1984. "Why is the the Unemployment Rate so Much Lower in Japan than in the U.S.?" Working paper No. 198, University of Minnesota.

Ito, Takatoshi, and Kyoungsik Kang. 1989. "Bonuses, Overtime, and Employment: Korea vs. Japan." *The Journal of the Japanese and International Economies* 3: 425-450.

Jacoby, Sanford M. 1989. "Pacific Ties: Employment Systems in Japan and the U.S. Since 1900." University of California, Los Angeles. Mimeo.

Japan Economic Planning Agency. 1987. Annual Report on Business Cycle Indicators. (August). Tokyo.

Japan Ministry of Labour. 1984. *Saishin Rodo Kyoyaku No Jitsujo* (The Latest Status of Labor Agreements). Tokyo.

Japan Policy Planning and Research Department, Ministry of Labour. Various years. *Yearbook of Labour Statistics*. Tokyo.

Japan Productivity Center. 1988. *Seisansei Undo 30 Nenshi* (The Thirty-Year History of Productivity Campaign). Tokyo.

_____ . 1987, 1988, 1989, 1990. *Katsuyo Rodo Tokei* (Practical Labor Statistics). Tokyo.

Japan Rodo Horei Kyokai. 1980. *Chingin Kozo Kihon Chosa* (Survey of Basic Wage Structure). Tokyo.

Japan Rodo Sho Rodo Kijun Kyoku. 1988 *Rodo Kijun Ho* (Labor Standards Law). Tokyo.

Japan Sangyo Rodo Chosa Sho. 1988. *Chingin Choki Keirei 50 Nen* (The 50-Year Long-Term Wage Series). Tokyo.

Japan Statistics Bureau, Management and Coordination Agency. 1989. *Japan Statistical Yearbook*. Tokyo.

_____ . 1988. *Annual Report on the Labour Force Survey*. Tokyo.

Jorgenson, Dale W., and Masahiro Kuroda. 1990. "Productivity and International Competitiveness in Japan and the United States." In *Productivity Growth in Japan and the United States*, ed. Charles R. Hulten. National Bureau of Economic Research Conference on Income and Wealth. Chicago: University of Chicago Press, forthcoming.

Jorgenson, Dale W., Masahiro Kuroda, and Mieko Nishimizu. 1987. "Japan-U.S. Industry-Level Productivity Comparisons, 1960-1979." *Journal of the Japanese and International Economies* 1: 1-30.

Juran, Joseph M. 1975. "Quality Control of Service—the 1974 Japanese Symposium." *Quality Progress* 13: 511-514.

Klein, Benjamin, R.G. Crawford, and Armen A. Alchian. 1978. "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process." *Journal of Law and Economics* 21: 297-326.

Koike, Kazuo. 1977. *Shokuba No Rodo Kumiai To Sanka* (Unions on the Shop Floor and Participation). Tokyo: Toyo Keizai Shimpo-Sha.

_____ . 1984. "Skill Formation Systems in the U.S. and Japan: A Comparative Study." In *The Economic Analysis of the Japanese Firms*, ed. Masahiko Aoki. Amsterdam: North-Holland.

_____ . 1987. "Japanese Redundancy: The Impact of Key Labor Market Institutions on the Economic Flexibility of the Japanese Economy." In *Labor Market Adjustments in the Pacific Basin*, ed. Peter Chinloy and Ernst Stromsdorfer. Boston: Kluwer-Nijhoff.

_____ . 1988. *Understanding Industrial Relations in Modern Japan*. New York: St. Martin's Press.

Koshiro, Kazutoshi. 1983a. "Development of Collective Bargaining in Postwar Japan." In *Contemporary Industrial Relations in Japan*, ed. Taishiro Shirai. Madison: University of Wisconsin Press.

_____ . 1983b. *Nihon-no Roshi Kankei* (Japanese Industrial Relations). Tokyo: Yuhikaku Publisher.

_____ . 1984. "Labour Dispute Settlement in the Japanese Postal Service." In *Industrial Conflict Resolutions in Market Economies*, ed. Tadashi Hanami and Roger Blanpain. Antwerp: Kluwer Law and Taxation Publishers.

_____ . 1986. "Labor Market Flexibility in Japan—With Special Reference to Wage Flexibility." Working Paper, Yokohama National University.

Kuratani, Masatoshi. 1973. "A Theory of Training, Earnings, and Employment: An Application to Japan." Unpublished Ph.D. dissertation, Columbia University.

Lazear, Edward P. 1979. "Why is There Mandatory Retirement?" *Journal of Political Economy* 87 (December): 1261-84.

_____ . 1981. "Agency, Earnings Profiles, Productivity, and Hours Restrictions." *American Economic Review* 71 (September): 606-20.

Levine, Solomon B., and Hisashi Kawada. 1980. *Human Resources in Japanese Industrial Development*. Princeton: Princeton University Press.

Levine, David, and Laura Tyson. 1990. "Participatory Employment Systems and the Firm's Environment." In *Paying for Productivity: A Look at New Evidence*, ed. Alan S. Blinder. Washington, DC: Brookings Institution.

Lilien, David M. 1980. "The Cyclical Pattern of Temporary Layoffs in United States Manufacturing." *Review of Economics and Statistics* 112: 24-31.

_____ . 1982. "Sectoral Shifts and Cyclical Unemployment." *Journal of Political Economy* 90: 773-93.

Matsuda, Yasuhiko. 1983. "Conflict Resolution in Japanese Industrial Relations." In *Contemporary Industrial Relations in Japan*, ed. Taishiro Shirai. Madison: University of Wisconsin Press.

McDonald, I. M., and Robert R. M. Solow. 1981. "Wage Bargaining and Employment." *American Economic Review* 71: 896-908.

McLaughlin, Kenneth J. 1987. "The Quit-Layoff Distinction in a Joint Wealth Maximization Approach to Labor Turnover." University of Chicago. Mimeo.

Minami, Ryoshin. 1986. *The Economic Development of Japan: A Quantitative Study*. New York: St. Martin's Press.

Mincer, Jacob. 1974. *Schooling, Experience, and Earnings*. New York: National Bureau of Economic Research.

Mincer, Jacob, and Yoshio Higuchi. 1988. "Wage Structures and Labor Turnover in the United States and Japan." *Journal of the Japanese and International Economies* 2: 97-133.

Miyazaki, Hajime. 1977. "The Rat Race and Internal Labor Markets." *The Bell Journal of Economics* 8: 394-418.

Moore, Richard H. 1985. *Land Tenure and Social Organization in a Rice-Growing Community in Tohoku Japan*, Unpublished Ph.D. dissertation, University of Texas, Austin.

Morishima, Michio. 1982. *Why Has Japan 'Succeeded?'* Cambridge: Cambridge University Press.

Moy, Joyanna. 1982. "Unemployment and Labor Force Trends in 10 Industrialized Nations: An Update." *Monthly Labor Review* 105: 18-21.

Moy, Joyanna, and Constance Sorrentino. 1981. "Unemployment, Labor Force Trends, and Layoffs Practices in 10 Countries." *Monthly Labor Review* 104: 3-13.

Nadiri, M. Ishaq, and Sherwin Rosen. 1973. *A Disequilibrium Model of Demand for Factors of Production*. New York: National Bureau of Economic Research.

Nakamura, Takafusa. 1971. *Economic Growth in Prewar Japan*. New Haven: Yale University Press.

_____ . 1981. *The Postwar Japanese Economy: Its Development Structure*. Tokyo: University of Tokyo Press.

Neumann, George, and Ellen R. Rissman. 1984. "Where Have All the Union Members Gone?" *Journal of Labor Economics* 2, 2: 175-192.

Nishikawa, Shunsaku, ed. 1980. *The Labor Market in Japan*. Tokyo: University of Tokyo Press.

Odaka, Konosuke. 1984. *Rodoshijo Bunseki* (Labor Market Analysis). Tokyo: Iwanami.

Ohashi, Isao. 1983. "Wage Profiles, Layoffs and Specific Training." *International Economic Review* 24: 169-181.

Oi, Walter. 1962. "Labor as a Quasi-Fixed Factor." *Journal of Political Economy* 70: 538-55.

_____ . 1983. "Heterogeneous Firms and the Organization of Production." *Economic Inquiry* 21: 147-71.

Oi, Walter, and John Raisian. 1985. "Impact of Firm Size on Wages and Work." University of Rochester. Mimeo.

Onitsuka, Yusuke. 1988. "The Oil Crisis and Japan's Internal-External Adjustment." Yokohama National University. Mimeo.

Ono, Tsuneo. 1980. "Postwar Changes in the Japanese Wage System." In *The Labor Market in Japan*, ed. Shunsaku Nishikawa. Tokyo: University of Tokyo Press.

Organization for Economic Cooperation and Development (OECD). 1984. *Employment Outlook*.

_____ . 1985. *Employment Outlook*.

_____ . 1986. *Economic Surveys: Japan*.

Osawa, Machiko. 1988a. "Report from the 1988 Conference on Industrial Relations." *Japan Labor Bulletin* 27, 6.

_____ . 1988b. "Working Mothers: Changing Patterns of Employment and Fertility in Japan." *Economic Development and Cultural Change* 36: 624-650.

Parsons, Donald O. 1986. "The Employment Relationship: Job Attachment, Work Effort, and the Nature of Contracts." In *Handbook of Labor Economics*, ed. Orley Ashenfelter and Richard Layard. Amsterdam: North-Holland.

_____ . 1988. "Age and the Employment Contract." The Ohio State University. Mimeo.

Patrick, Hugh, ed. 1976. *Japanese Industrialization and Its Social Consequences*. Berkeley: University of California Press.

Peters, Elizabeth H. 1986. "Marriage and Divorce: Informational Constraints and Private Contracting." *American Economic Review* 76: 47-454.

Raisian, John. 1979. "Cyclic Patterns in Weeks and Wages." *Economic Inquiry* 17: 475-95.

_____ . 1983. "Contracts, Job Experience, and Cyclic Labor Market Adjustments." *Journal of Labor Economics* 1: 152-170.

Rosen, Sherwin. 1968. "Short-Run Employment Variation in Class I Railroads in the U.S., 1947-1963." *Econometrica* 36: 511-29.

_____ . 1985. "Implicit Contracts: A Survey." *Journal of Economic Literature* 23: 1144-75.

Salop, Joanne, and Steven Salop. 1976. "Self-Selection and Turnover in the Labor Market." *Quarterly Journal of Economics* 90 (November): 619-27.

Saxonhouse, Gary. 1976. "Country Girls and Communication Among Competitors in the Japanese Cotton-Spinning Industry." In *Japanese Industrialization and its Social Consequences*, ed. Hugh Patrick. Berkeley: University of California Press.

Seike, Atsushi. 1986. "Analysis of the 1986 Spring Labor Wage Offensive." *Japan Labor Bulletin* 26, 8. Reprinted in the Japan Labor Institute, *Highlights in Japanese Industrial Relations*, Vol. 2, 1988.

Shimada, Haruo. 1981. *Economic Structure and Human Investment: A Comparison Between the United States and Japan.* Tokyo: Keio Economic Observatory.

_____ . 1983. "New Challenges for Japanese Labor-Management Relations in the Era of Global Structural Change." *Japan Labor Bulletin* 22: 5-8.

_____ . 1988. *Human Ware No Keizaigaku* (The Economics of Humanware). Tokyo: Iwanami.

Shimada, Haruo, and Yoshio Higuchi. 1985. "An Analysis of Trends in Female Labor Force Participation in Japan." *Journal of Labor Economics* 3: S355-S374.

Shirai, Taishiro. 1983. "A Theory of Enterprise Unionism." In *Contemporary Industrial Relations in Japan*, ed. Taishiro Shirai. Madison: University of Wisconsin Press.

Sloan, Arthur A., and Fred Whitney. 1988. *Labor Relations* (6th edition). Englewood Cliffs: Prentice Hall.

Sorrentino, Constance. 1976. "Unemployment Compensation in Eight Industrial Nations." *Monthly Labor Review* 99: 18-24.

_____ . 1981. "Youth Unemployment: An International Perspective." *Monthly Labor Review* 99: 18-24.

_____. 1984. "Japan's Low Unemployment: An In-Depth Analysis." *Monthly Labor Review* 107: 18-27.

St. Antoine, T. (1984). "Conflict Resolution in Industrial Relations." In *Industrial Conflict Resolution in Market Economies*, ed. Tadashi Hanami and Roger Blanpain. Antwerp: Kluwer Law and Taxation Publishers.

Stockman, Alan. 1983. "Aggregation Bias and the Cyclical Behavior of Real Wages." Unpublished manuscript, University of Rochester.

Sugeno, Kazuo, and Kazutoshi Koshiro. 1987. "The Role of Neutrals in the Resolution of Shop Floor Disputes: Japan." *Comparative Labor Law Journal* 9: 129-163.

Tachibanaki, Toshiaki. 1986. "Labour Market Flexibility in Japan, Europe and the United States." Working paper, Kyoto Institute of Economic Research.

Taira, Koji. 1970. *Economic Development and the Labor Market in Japan.* New York: Columbia University Press.

_____ . 1983a. "Labor Productivity and Industrial Relations in the United States and Japan." In *Proceedings of the Thirty-Fifth Annual Meeting*, ed. Barbara D. Dennis. Madison: Industrial Relations Research Association.

_____ . 1983b. "Japan's Low Unemployment: Economic Miracle or Statistical Artifact?" *Monthly Labor Review* 106: 3-10.

Taira, Koji, and Solomon B. Levine. 1985. "Japan's Industrial Relations: A Social Compact Emerges." In *Industrial Relations in a Decade of Economic Change*, ed. Harvey Juris, Mark Thompson, and Wilbur Daniels. Madison: Industrial Relations Research Association.

Takezawa, Shin-ichi, and Arthur Whitehall. 1981. *Work Ways: Japan and America.* Tokyo: The Japan Institute of Labor.

Tan, Hong W. 1981. "Wage-Tenure Profiles in Contractual Labor Markets." The Rand Corporation. Mimeo.

_____ . 1987. "Technical Change and Its Consequences for Training and Earnings." The Rand Corporation. Mimeo.

Taylor, John B. 1989. "Differences in Economic Fluctuations in Japan and the United States: The Role of Nominal Rigidities." *Journal of the Japanese and International Economies* 3: 127-144.

Tominomori, Kenji. 1985. "Unemployment Rates of Japan and the United States." *Japanese Economic Studies* 14: 62-73.

Topel, Robert H. 1982. "Inventories, Layoffs, and the Short-Run Demand for Labor." *American Economic Review* 72: 769-787.

Trivedi, Pravin K. 1981. "Dynamics of Output and Inventory in the Japanese Woolen Textile Industry: A Further Analysis of the Carland-Pagan Model." *The Economic Record* 67: 91-94.

Uchino, Tatsuro. 1983. *Japan's Postwar Economy: An Insider's View of Its History and its Future*. Tokyo: Kodansha International.

Umemura, Mataji. 1980. "The Seniority-Merit Wage System in Japan." In *The Labor Market in Japan*, ed. Shunsaku Nishikawa. Tokyo: University of Tokyo Press.

U.S. Bureau of the Census. 1990. *Statistical Abstract of the United States*. Washington, D.C.

U.S. Bureau of Economic Analysis. 1987. *Business Statistics 1986. A Supplement to the Survey of Current Business*. Washington, D.C.

U.S. Bureau of Labor Statistics. (Various years). *Employment and Earnings*. Washington, D.C.

_____ . 1983. *Handbook of Labor Statistics*. Bulletin 2175. Washington D.C.

_____ . 1985. *Handbook of Labor Statistics*. Bulletin 2217. Washington D.C.

_____ . 1989. *Handbook of Labor Statistics*. Bulletin 2340. Washington, D.C.

Weitzman, Martin L. 1984. *The Share Economy: Conquering Stagflation*. Cambridge: Harvard University Press.

Welch, Finis. 1970. "Education in Production." *Journal of Political Economy* 78: 35-59.

Williamson, Oliver. 1975. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York: Free Press.

_____ . 1985. *The Economic Institution of Capitalism*. New York: Free Press.

Yasuba, Yasukichi. 1976. "The Evolution of Dualistic Wage Structure." In *Japanese Industrialization and Its Social Consequences*, ed. Hugh Patrick. Berkeley: University of California Press.

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